Evaluation of Medicaid Managed Care Programs with 1915 (b) Waivers

Final Report

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Acknowledgments

Executive Summary

Research Triangle Institute in collaboration with Indiana University and Health Economics Research conducted this quantitative impact analysis for the Health Care Financing Administration to extract lessons from the experience of four Medicaid managed care programs with 1915(b) waivers. These lessons are intended to help other states and localities as they implement new broader managed care programs for Medicaid populations under 1115 waivers or under the authority of the Balanced Budget Act of 1997. The study is part of a larger effort in which the study team also conducted site visits to 1915(b) waiver programs in nine states to study implementation and operational issues. These results are reported elsewhere.

The programs studied in this report include:

- The Santa Barbara Health Initiative and the Health Plan of San Mateo in California. These two programs are at risk, county-organized programs and are among the longest running 19 15(b) programs and the earliest to provide coverage to disabled enrollees. Hence, we were able to study long-term program impacts on both disabled and non-disabled Medicaid beneficiaries.

- The 19 15(b) program in Montgomery County, Ohio that converted voluntary enrollment in health maintenance organizations (HMOs) for Aid to Families with Dependent Children (AFDC) beneficiaries into mandatory enrollment for this population. Because half of the Medicaid population in the county were African American, we were able to also investigate whether the conversion from voluntary to mandatory managed care differentially affected African American and white beneficiaries.

- The Medicaid Provider Access System (MediPass) in Florida is a primary care case management (PCCM) program. MediPass enrollment is required for all AFDC-related and poverty-related expansion enrollees who do not voluntarily enroll in HMOs. Thus, we were able to study the impact of implementing mandatory PCCM enrollment over traditional fee-for-service (FFS) among Medicaid beneficiaries declining HMO enrollment.

- The New Mexico Primary Care Network (PCN) is a statewide mandatory PCCM program covering most Medicaid eligibility categories. In the analysis of PCN, we were able to study the impact of a PCCM model in a predominantly rural state, among nondisabled and disabled Medicaid beneficiaries, and among two minority populations-Hispanics and Native Americans.

We tested hypotheses in four related areas: access to care, use of preventive services, patterns of inpatient and outpatient care, and expenditures for care. To test the hypotheses in Ohio, Florida, and New Mexico, we used a quasi-experimental research design with both pre-post and contemporaneous comparisons of Medicaid claims/encounter data summarized at the person-year level. For the two programs and a comparison county in California., we conducted a longitudinal analysis of six years of claims/encounter data summarized at the person-month level.

We provided separate analyses for children and adults in selected eligibility categories. We estimated the average county or county cluster program impact. In addition, because we found that many beneficiaries who were eligible for the mandatory managed care programs had several months of FFS coverage under Medicaid, we also broke out the program effect by level of participation in the managed care program.

- **Access to Primary Care.** We measured changes in access to primary care by looking for a particular pattern of service use. In particular, we regarded a concurrent increase in any ambulatory care days together with declines in visits to the emergency room and in any hospitalizations for ambulatory care sensitive conditions as indicative of improved access to primary care. We did not find consistent improvement in access to primary care among the 1915(b) programs studied. However, we did find some indications of improvement-particularly among those beneficiaries who were continuously enrolled in the managed care program during the analysis year. Furthermore, we saw no indications that access to primary care worsened for beneficiaries enrolled in Medicaid managed care programs.

- **Use of Preventive Care.** We looked at three preventive care measures: (1) compliance with well-child visit schedules among preschool-aged children, (2) compliance with childhood immunizations schedules among infants and toddlers, and (3) the extent to which women in child-bearing ages received annual preventive pap smears. Our analysis shows that the great promise of managed care to substantially increase tbe use of preventive care was not met in the programs studied. The only improvements of note were among beneficiaries continuously enrolled in managed care, but the increases among these beneficiaries were very small.

- **Patterns of Service Use.** We looked at a variety of service use measures. The most consistent trend was less use of emergency rooms among Medicaid beneficiaries enrolled in managed care compared to those enrolled in FFS Medicaid. Fewer hospital stays and inpatient days of care were found for certain beneficiaries in a few of the programs. However, again though, we did not consistently find these results.

- **Control of Medicaid Expenditures.** Similarly using different measures of Medicaid expenditures, we find no consistent evidence that expenditures have been reduced as a result of 19 15(b) waiver programs. While counterfactual estimates of what FFS payments would have been for the managed care enrollees show small savings from managed care in two programs (Florida and New Mexico), they show cost increases in the third (Ohio). In the two California programs, where counter-factual estimates were not possible, we did see larger declines over time in total Medicaid payments (adjusted for inflation by the medical component of the Consumer Prince Index) among the disabled population who account for a disproportionate share of total Medicaid costs.

- **Impact on Minority Populations.** African American Medicaid beneficiaries in Ohio and Hispanic and Native American Medicaid beneficiaries in New Mexico used fewer health services than white beneficiaries. Furthermore, the waiver **programs** appeared to have differential impacts on African Americans and Native Americans compared to

whites. However, while mandatory enrollment in HMOs in Ohio appeared to have had less of an impact on African Americans compared to whites, the PCCM program in New Mexico had a greater impact on Native Americans compared to whites.

Thus, the study findings are encouraging in some aspects but discouraging in others. We found limited evidence that in the early 1990s, the 1915(b) Medicaid managed care programs that we studied dramatically changed patterns of utilization and expenditures compared to the FFS program. The main lesson learned is that managed care as it existed during the analysis period was not enough to dramatically improve access to care and use of preventive care. It also was not enough to realize substantial program cost savings. At the same time, we learned that the states implemented some substantial program changes without seriously curbing beneficiaries access to or use of health care services, and in selected instances, minor improvements in these goals were realized.

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Chapter 1: Introduction

by:

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1. Introduction

Over 15.3 million Medicaid beneficiaries, 47.8 percent of the covered population, are enrolled in some type of managed care plan under either section 1915(b) or 1115 waivers (HCFA, 1997). Section 1915(b) of the Social Security Act allows states to mandate managed care enrollment, curtail Medicaid recipients' right to choose a provider, and override statewide operations and benefits. Section 1115 of the Social Security Act allows broader changes, permitting States to conduct projects that alter Medicaid's structure—e.g., change eligibility requirements, provider payment methodologies, and federal requirements for health maintenance organizations (HMOs). The more recent 1115 initiatives have relied heavily on enrollment in managed care systems for controlling costs and improving access to health care for Medicaid populations. The managed care lessons from the earlier, more limited Section 1915(b) programs are often directly applicable to 1115 waiver efforts. These lessons are even more important today with the passage of the Balanced Budget Act of 1997 which permits States to require Medicaid beneficiaries to enroll in managed care organizations without either a 1915(b) or an 1115 waiver.

With some state 1915(b) waiver programs in operation for over a decade, a review of their experiences can provide important lessons for program developers that may help them avoid some of the serious developmental and operational problems that plagued and even killed some early managed care programs.

Research Triangle Institute (RTI) and our subcontractors, Indiana University and Health Economics Research, Inc., under contract with the Health Care Financing Administration, undertook a study to extract lessons from the experiences of states and localities that have used 1915(b) waivers to implement Medicaid managed care programs. The study took two interrelated approaches: (1) analysis of implementation and operational issues through case studies in seven states, and (2) quantitative analysis of the cost and use of health services in a subset of four of these states. This report presents the findings from the quantitative analyses. The findings of the case studies are presented in an earlier report (RTI, 1997).

2. Site Selection

We selected sites for the quantitative analyses based on a set of criteria that included the evaluability of the programs (e.g., program size and data availability) and the ability of the programs to address key unanswered questions on Medicaid managed care (e.g., changes in service use and expenditures as programs mature and how rural, minority, and disabled populations fare under Medicaid managed care). Four sites were chosen for the case studies-California, Ohio, Florida, and New Mexico.

2.1 California

California's Medicaid (Medi-Cal) managed care experience provided a unique opportunity to investigate the long-term effects of managed care among both disabled and nondisabled Medicaid beneficiaries. The Santa Barbara Health Initiative (SBHI) and the Health Plan of San Mateo (HPSM) are two of the longest-running 1915(b) waiver programs in the United States. The SBHI was implemented in 1981, and HPSM began operations in 1987. Both

plans are at risk county organized health systems and require that all Medicaid beneficiaries, except children in foster care and persons residing in health care institutions, sign up with a primary care provider under the program.

The SBHJ and HPSM were among the earliest Medicaid managed care programs to sign up Supplemental Security Income (SSI) recipients. Most first-generation managed care programs covered only recipients of Aid to Families with Dependent Children (AFDC) and related eligibles, carving out coverage of special populations such as elderly and disabled SSI recipients. Hence, little information exists on the impact of managed care on SSI Medicaid beneficiaries. The analysis of the SBHI and HPSM provided below helps fill this gap.

In addition, most studies of first-generation Medicaid managed care programs focused on cross-sectional program effects among newly enrolled Medicaid participants or explored pre/post program effects in an early implementation year (Hurley, Freund, and Paul, 1993). We were able to obtain seven consecutive years (1987 to 1992) of comparable claims and encounter data for Medicaid beneficiaries enrolled in SBHI, HPSM, and the traditional fee-for-service (FFS) program in Ventura County. No other study of Medicaid managed care has covered such a extended period of operation; our study is the first to examine the impact of Medicaid managed care over time.

2.2 Ohio

Ohio received a 1915(b) waiver in May 1989 to implement a mandatory managed care program in Montgomery County (the Greater Dayton area). The Ohio 1915(b) program mandated enrollment in one of three HMOs among the County's approximately 42,000 Medicaid AFDC recipients.'

Ohio has contracted with managed care programs since 1978 for the coverage and provision of health services to eligible ADFC recipients who wish to voluntarily enroll. In Montgomery County during the 12 months prior to implementation of mandatory HMO enrollment under the 19 15(b) waiver, 4 1 percent of AFDC children and 34 percent of AFDC adults enrolled in Medicaid were voluntarily enrolled in HMOs. Thus, our evaluation of the 1915(b) program is an analysis of the impact on beneficiaries as a State moves from voluntary to mandatory HMO enrollment.

Because of a large African-American population enrolled in the Ohio Medicaid program-approximately one half of Montgomery County Medicaid beneficiaries are African American-we were also able to investigate racial differences in the impact of Medicaid managed care.

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[1] The State is currently implementing a comprehensive Medicaid reform program (OhioCare) with similar features under an 1115 waiver.

2.3 Florida

In 199 1, under a Section 19 15(b) waiver, Florida implemented a primary care case management (PCCM) program, the Medicaid Provider Access System (MediPass), as the default Medicaid coverage for certain beneficiaries not choosing to enroll in HMOs. These beneficiaries included AFDC cash assistance recipients, other Medicaid-enrolled families with children, and pregnant women and children enrolled in Medicaid under the State Omnibus Budget Reconciliation Act expansion categories. In 1996, the State expanded the MediPass program to other counties and eligibility groups.

Our analysis is focused on the early experience of the program in the initial four-county pilot area (around Tampa-St. Petersburg) and the original eligibility groups. Because we were not able to obtain comparable encounter data for Medicaid beneficiaries who were enrolled in HMOs, we excluded beneficiaries with any HMO coverage during the study period from the analysis. Therefore, the estimated program impact in our study is the effect of implementing a mandatory PCCM program over a traditional FFS program among Medicaid beneficiaries who declined voluntarily HMO coverage.

2.4 New Mexico

New Mexico obtained a 1915(b) waiver in 1991 to implement the Primary Care Network (PCN), a statewide mandatory PCCM program. The program was implemented in stages; by the end of 1993, 23 of New Mexico's 33 counties had implemented the program. We chose the New Mexico PCN program for analysis because it provided an opportunity to study the impact of a PCCM model in a predominantly rural State, among Supplemental Security Income (SSI) recipients and other aged and disabled Medicaid beneficiaries, and among two minority populations-Hispanics and Native Americans.

Most early generation managed care models were in urban settings where Medicaid populations are concentrated and providers are more numerous. Therefore, little data exists on the success of these programs in rural areas. In addition, as noted above, there is a dearth of information on how managed care impacts SSI-related Medicaid beneficiaries. New Mexico's PCN program is mandated for individuals enrolled under AFDC- and SSI-related. eligibility groups and most poverty-related expansion beneficiaries (i.e., pregnant women and young children in poor and near-poor families). Finally, approximately one half of all New Mexico Medicaid beneficiaries eligible for the PCN program in 1993 were Hispanic and another 11 percent were Native American. Thus, the New Mexico PCN program provided an opportunity to study the impact of a PCCM model on these population groups.

3. Research Questions

For all four States, we investigated the success of the waiver programs in achieving the following four goals of Medicaid managed care: (1) to improve access to primary health care; (2) to promote the use of preventive care services; (3) to change patterns of service utilization; and (4) to control health care expenditures. In two of the States, we also investigated whether the programs had differential impacts on minority populations. In Ohio, we investigated whether there was a differential impact on African-American beneficiaries compared to white beneficiaries, and in New Mexico, we investigated whether there was a differential impact on Hispanic and Native American beneficiaries compared to white beneficiaries.

We found that Medicaid beneficiaries who were required to enroll in managed care programs, for a variety of reasons, frequently had several months of coverage under the **fee-for-**service **(FFS)** program. Therefore, in addition to the average impact on eligible beneficiaries in the waiver county or county clusters, we also investigated how the program impact varied by beneficiaries who participated in managed care for their full enrollment period during the year (the continuously enrolled), beneficiaries whose participation in managed care was delayed (e.g., for individuals with retroactive Medicaid eligibility and newly enrolled individuals undergoing the process of selecting a primary care provider), beneficiaries who enrolled and subsequently disenrolled before the end of the year or the end of their Medicaid enrollment period, and beneficiaries who were eligible but never enrolled in managed care during the year.

4. Methodology

To evaluate the impact of the 1915(b) waiver program in three of the States-Ohio, Florida, and New Mexico-we used a quasi-experimental research design with both **pre/post** and contemporaneous comparisons of Medicaid claims/encounter data summarized to the person-year level. In Florida and New Mexico, we used the universe of eligible beneficiaries in our analyses. To reduce the data burden on the managed care organizations, we used a stratified random sample of eligible beneficiaries in the Ohio analysis.

For the California analysis, we also used a comparison county for the analysis but instead of only two years of data, we used six years of data summarized to the person-month level and conducted a longitudinal analysis. To our knowledge, this is the **first** study that has taken a longitudinal approach to evaluating the impact of Medicaid managed care.

We used several health service use measures from the claims data to provide evidence of the program's success in meeting each of the four goals of managed care listed above. We compared the levels of and the changes over time in these measures between the experimental and comparison groups. In addition, we used multivariate econometric techniques to control for demographic characteristics, Medicaid enrollment duration and category, and other selected factors independently influencing health service use. Where the data allowed, **separate** analyses were performed for children and **adults** enrolled in Medicaid under AFDC-related, SSI-related, and other eligibility criteria.

We also examined how the impact of Medicaid enrollment duration affected the program impact. In the multivariate analyses for three of the States (all but California), we broke out the program effect into level of participation in the managed care program during the year by including interaction terms with the program impact variable and the participation level variable. For California, because of the long time line in our analysis and the availability of enrollment data back to 1982, we were able to estimate the impact of multiple years of enrollment in either managed care or FFS. Similarly, in two of the states, we interacted race/ethnicity with the program impact variable to determine any differential program effects among African Americans, Hispanics, and Native Americans.

5.   Organization of the Report

The report is organized by state. Analyses of the impact of the 1915(b) waiver programs in California, Ohio, Florida, and New Mexico are presented in that order in the following chapters. Each chapter begins with a fuller description of the waiver program and beneficiary population under study. A description of the methodology used for that particular analysis is then presented and is followed by a detailed description of the results and a summary section. The final chapter presents a cross-state synthesis of the study findings on the impact of Medicaid managed care programs with 1915(b) waivers on beneficiaries' access to primary care, use of preventive and inpatient health services, and total Medicaid expenditures.

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Chapter 2: County Organized Health Systems in California

by:

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1.   Introduction

California's Medicaid (Medi-Cal) managed care (MMC) experience allows for a unique investigation of a hitherto unexplored frontier in MMC: the long-term effects of managed care among diverse groups of enrollees. Most first-generation studies of MMC focused on **cross-**sectional program effects from newly enrolled Medicaid participants (Hurley, Freund, and Paul, 1993). Other studies explored **pre/post** program effects, but rarely extended beyond one-year program effects. In addition, previous studies could not always reliably gauge the impact of managed care because enrolled populations differed in systematic ways from non-enrolled populations (selection bias or contaminated controls), plus certain types of enrollees might drop out of the managed care program further biasing impact estimates (attrition bias). In addition, most first-generation managed care programs covered only recipients of Aid to Families with Dependent Children (AFDC) and related eligibles, carving out coverage of **special** populations such as elderly or disabled Supplemental Security Income (**SSI**) recipients, who are **policy-**relevant because of their high cost. This report examines the contrasting Medi-Cal experiences of three counties in California over the years 1987 to 1992: San Mateo, which **implemented** a county organized managed care program in 1987; Santa Barbara, which has had a. managed care program in place since 198 1; and Ventura, which did not implement a managed care program until 1994.

The success of MMC will be judged on the basis of several dimensions. In general, our analyses center around testing the ability of MMC to: (1) improve access to primary health care, (2) promote the use of preventive care services, (3) change patterns of service utilization, and (4) control health care expenditures. While all of the questions have been addressed in short-run assessments of MMC, our study is the first to examine the issues over time. We use a number of health care utilization, access, and cost measures to examine the impact of MMC over time, including bivariate descriptive methods as well as longitudinal multivariate econometric techniques that allow for precise estimation of person-level changes in outcomes lover time.

In Section 2, we describe the study population and relevant institutional details of the three counties involved in our study. Section 3 describes the research questions to be addressed in our analyses. In Section 4, we describe the estimation methods and describe the dependent and independent variables used in our multivariate models. We present the results of the descriptive and multivariate analyses in Section 5. Finally, in Section 6 we summarize the results and discuss the implications of our findings.

2.   Background

California has long been recognized as an innovator in the realm of health care delivery systems. Managed care itself largely began in California with Kaiser-Permanente. California also was a leader in the development of managed care systems with the Medi-Call program. As a result, California has much to offer the rest of the nation in terms of its experience with managed care. The three counties we considered in the evaluation of 1915(b) waivers in California

represent a variety of programmatic experience while still sharing adequate size, (covered populations, longitudinal data availability, and mandatory status suitable for quantitative study.

2.1   Key Features of County Organized Health Plans

The Santa Barbara Health Initiative (SBHI) and the Health Plan of San Mateo (HPSM) are two of the longest-running 1915(b) waiver programs in the United States. Both plans are at-risk county organized health systems, and both feature local administration and a requirement that all Medicaid eligibles sign up with a primary care physician (PCP) of their choice. The PCP is responsible for delivering all primary care and for issuing prior authorization for all other care, whether from specialists or hospitals.

Each plan contracts with local providers to deliver all Medi-Cal approved services in the area. In addition, plans are free to offer services outside of the standard Medi-Cal benefit package at their own expense. However, certain services are carved out of managed care coverage; these services are offered through regular Medi-Cal and not by either plan. During ther study period, carved out services included dental care, adult day care, and well-child care provided under the Early and Periodic Screening, Diagnostic, and Treatment (EPSDT) program.

Physicians were placed at financial risk in both plans, and hospitals were at risk in HPSM, but not in SBHI. Overall, upwards of 70 percent of all PCPs in each county participated in the plans. In both plans PCPs were paid on a capitation basis, wherein 80 percent of the capitation was advanced monthly, while the remaining 20 percent was withheld until the end of the year, when account adjustments were made. PCPs in San Mateo and Santa Barbara selected an individual hospital risk pool with which to affiliate.

Ventura County maintained a traditional fee-for-service (FFS) system throughout the study period. As such, patients had no PCP to serve as a gatekeeper to health care services, and providers were remunerated for services rendered by submitting claims to Medi-Cal. Nonetheless, as the lessons of care management have been learned throughout the health care system, including traditional FFS programs, it is possible that Ventura County may have grown to look more like the managed care counties in our study over time.

The county organized health systems faced the potential threat of sanctions if there was not prompt and accurate reporting of utilization. State officials reported that sanctions were not invoked at any time during our study period. Nevertheless, we found some erratic dips in the data for certain services in Santa Barbara and San Mateo over time, suggesting that service use was not consistently reported. Ventura County relied on the fact that reporting from providers was essential for reimbursement to assure administrative reporting of service utilization.

. 2.2 Study Population

The study of each county is informed by a different data set. For capitated programs, acquiring encounter or event-level data often has been a problem in other settings. Little incentive exists for capitated health plans to record detailed encounter-level information because reimbursement is no longer based on individual services performed, and extensive paperwork

and electronic data management can be costly. However, in California, plans were required to submit administrative records of medical encounters to the Medi-Cal agency (known as pseudo-claims). Health service utilization measures from San Mateo County were based on pseudo-claims provided by the Health Plan of San Mateo. Santa Barbara utilization measures were based on pseudo-claims provided by the Santa Barbara Health Initiative. Ventura County claims were provided from the Tape-to-Tape (TIT) project.' All outcome measures were aggregated to the person-month level, then matched to the monthly enrollment data (collected through the TTT program) to determine eligibility category and enrollment status. Santa Barbara and Ventura data span the 72 months from January 1987 to December 1992. San Mateo observations also range from January 1987 to December 1992, but substantial enrollment levels were not reached until November 1987,

Our study is among the first to thoroughly examine the non-Medicare SSI population. Because Qualified Medicare Beneficiaries may have services paid by both Medicare and Medi-Cal, outcomes measures derived solely from Medi-Cal claims are likely to under-report actual health care utilization. As a result, we omit all enrollees 65 years of age and over..

As mentioned above, EPSDT services were carved out from the county organized health plans and reimbursed on a fee-for-service basis. However, EPSDT service utilization for 1989 through 1992 was stored within the TTT files for all California counties. Thus, we were able to extract and compare the EPSDT screening visit and immunization claims information from the TTT files for all three study counties for the latter four years of the study period.

Table 2-l displays the demographic and programmatic attributes of the sample members within each county. We first observe that Ventura County includes roughly twice as many enrollees as San Mateo and Santa Barbara Counties, though the difference is proportionate to the overall county populations. The counties are generally similar in make-up. One noteworthy difference is the larger proportion of elderly enrollees in San Mateo. The difference—attributable to a higher proportion of elderly residents in the county population-is also observed in the higher proportion of SSI eligibles in San Mateo. In addition, San Mateo County appears to have disproportionately more African Americans relative to Santa Barbara and Ventura Counties.

The distribution of enrollment durations was somewhat bimodal, as there were large proportions of short-term (less than or equal to six months) enrollees and long-term (two years or more) enrollees. It is important to note that for 1987 enrollment figures for Santa Barbara and Ventura refer to the first year that enrollees were observed in our data set; i.e. persons could have first enrolled in the program prior to 1987. The distinction is an important one, especially because in our multivariate models, we attempted to discern how utilization and cost differ based on time enrolled within each respective program. As discussed later, we partly solve the problem by following individuals back to as early as 1982 through the TIT records to determine their

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'The Tape-to-Tape database includes all enrollment and claims data from the automated Medicaid information systems in four states (California, Georgia, Michigan and Tennessee) for calendar years 1980 through 1992. Data maintained in this database have been edited and reformatted to produce uniform files that facilitate cross-State and cross-year comparative analyses.

**Table 2-1: Percentage Distribution of Demographic and Medi-Cal
Enrollment Characteristics Among Medicaid Beneficiaries by County**

	San Mateo	Santa Barbara	Ventura
Number of Enrollees	71,349	72,274	**144,781**
Age at Enrollment (years)			
0-2	25.9	27.5	25.4
3-5	8.9	8.9	8.6
6-17	23.6	22.9	23.6
18-24	11.7	12.8	14.6
25-54	25.2	24.6	24.8
55-64	4.8	3.3	3.1
Gender			
Male	41.6	42.6	40.9
Female	58.4	57.4	59.1
Race			
White	28.3	32.6	29.2
African-American	18.7	5.3	3.2
Other	40.8	45.7	50.0
unknown	12.2	16.5	17.6
Eligibility Category			
AFDC	70.0	74.9	76.1
SSI	14.6	10.7	8.8
Other	15.4	14.4	15.0
Enrollment Duration (Months)			
1-6	24.6	24.1	29.5
7-12	21.5	19.9	22.1
13-18	12.7	11.3	10.8
19-24	9.2	8.8	8.5
25+	32.0	35.9	29.1
Enrollment Year			
1987 or earlier	24.1	36.2	33.8
1988	15.2	13.3	10.5
1989	14.1	12.1	12.0
1990	13.7	11.7	12.1
1991	16.8	13.4	15.7
1992	16.1	13.3	16.0

cumulative duration of eligibility. In San Mateo the managed care program began in 1987; thus, we observe San Mateo enrollees from the initial implementation of the managed care plan.

Tables 2-2a-2-2c display bivariate sample characteristics within each county, stratified by eligibility group. In San Mateo and Santa Barbara some managed care enrollees disenrolled from the managed care program and reverted to FFS. In other cases, enrollees became ineligible for Medicaid, but later regained their eligibility status and rejoined the managed care plan. Typically exemptions from managed care are granted because enrollees have special needs that cannot be accommodated within the program. Such exemptions, for instance, are common among AIDS patients.

A notable trend observed in Tables 2-2a-2-2c is the increasing proportion of Other children enrolled over time in all three counties. This increase is a result of the poverty-related eligibility expansions during the late 1980's and early 1990's. In addition, over this period, the number of undocumented aliens in California using Medi-Cal services, particularly under the age of 21, increased substantially. Other children tended to be younger and less likely to be African American and more likely to be other racial/ethnic minorities than AFDC and SSI children.

We observe that the across-county cell proportions are roughly similar. AFDC adult enrollees tended to be disproportionately short-term enrollees, while SSI adults tended to be disproportionately long-term enrollees. The pattern is expected because SSI enrollees must meet a disability criterion that, by definition, is a long-term health problem. Also of interest is that a large proportion of AFDC enrollees in all three counties tended to have discontinuous enrollment patterns. However, relatively few managed care enrollees reverted to FFS program over the course of our study. In cases where enrollees had FFS coverage during our observation period, their FFS utilization was dropped from the analysis so as not to bias the estimated managed care impacts.

Table 2-3 displays average numbers of months enrolled and the distribution of enrollment over time by eligibility group. As mentioned above, an added complexity in the data set is that at the start of our observation window, January 1987, many enrollees in Santa Barbara had already been enrolled in the managed care plan for a period of time. The issue is not a problem in San Mateo because the Health Plan of San Mateo began enrolling Medi-Cal eligibles during 1987; therefore there was no prior unobserved period of managed care enrollment. To correct the measurement problem, we followed enrollees in Santa Barbara and Ventura Counties back in time through 1982 with the TTT enrollment files in order to determine the number of months that predated our observation window?

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[2] By tracing left-censored enrollees back to 1982, we solve the problem for Santa Barbara County because the Santa Barbara Health Initiative began in 1982. In Ventura County the initial group of over 34,000 left-censored enrollees is reduced to a somewhat more reasonable 11,000 enrollees after tracking enrollment back to 1982; the remaining 11,000 enrollees are simply assumed to have enrolled in 1982. It is important to note that we do not examine utilization prior to 1987, but we do control for whether individuals in Santa Barbara and Ventura were enrolled prior to 1987.

Table 2-2a: Percentage Distribution of Demographic and Medicaid Enrollment Characteristics Among Medicaid Beneficiaries by Eligibility Group—San Mateo

	AFDC Children	SSI Children	Other Children	AFDC Adult	SSI Adults	Other Adult
Number of Enrollees	31.817	423	9,392	18,110	9,985	1,622
Age at Enrollment (years)						
0-2	42.9	14.9	51.0	---	---	---
3-5	16.4	18.0	11.2	- -	-	---
6-17	40.8	67.1	37.9	---	---	- -
18-24	- -	- -	- -	34.1	9.5	77.1
25-54	---	---	---	64.0	60.9	17.6
55-64	- -	---	---	1.9	29.6	5.4
Gender						
Male	49.3	55.6	49.3	18.7	51.4	37.8
Female	50.7	44.4	50.7	81.3	48.6	62.2
Race						
White	23.6	28.4	14.8	31.3	49.3	35.1
African-American	23.6	16.6	6.0	19.7	15.8	4.9
Other	43.3	33.3	64.8	34.8	22.2	33.7
Unknown	9.4	21.7	14.4	14.2	12.8	26.2
Enrollment Duration (Months)						
1-6	22.2	16.3	34.1	29.0	12.7	41.6
7-12	21.6	18.4	22.5	23.5	15.1	31.6
13-18	13.2	10.4	14.1	13.0	9.7	12.0
19-24	9.8	8.0	10.6	8.7	7.5	5.3
25+	33.3	46.8	18.7	25.8	55.0	9.6
Enrollment Year						
1987 or earlier	23.3	36.4	9.1	23.0	44.3	12.0
1988	15.0	12.3	14.0	18.2	12.0	15.5
1989	14.1	10.2	16.4	14.3	11.2	17.5
1990	14.3	10.4	16.4	13.4	9.7	15.2
1991	17.1	13.5	23.8	15.7	10.5	20.2
1992	16.2	17.3	20.3	15.3	12.4	19.6
Enrollment Pattern						
Continuous	67.4	73.3	59.0	63.1	76.3	68.5
Discontinuous	21.5	16.3	24.4	24.2	14.4	20.0
Switch to FFS	5.5	7.1	6.9	4.9	6.7	4.3
Discon. & FFS	5.7	3.3	9.8	7.8	3.7	7.2

Table 2-2b: Percentage Distribution of Demographic and Medicaid Enrollment Characteristics Among Medicaid Beneficiaries by Eligibility Group-Santa Barbara

	AFDC Children	SSI Children	Other Children	AFDC Adults	SSI Adults	Other Adults
Number of Enrollees	33,506	512	8,808	20,597	7,258	1,593
Age at Enrollment (years)						
o-2	43.0	10.6	61.5	- -	- -	- -
3-5	15.9	12.9	11.7	- -	-	- -
6-17	41.2	76.6	26.8	- -	-	---
18-24	__	---	---	33.8	11.9	90.7
25-54	- -	- -	__	64.4	60.7	6.7
55-64	- -	---	---	1.8	27.4	2.7
Gender						
Male	49.0	56.1	50.6	24.7	54.1	37.7
Female	51.0	43.9	49.4	75.3	45.9	62.3
Race						
White	29.2	51.6	15.1	35.3	60.0	34.5
African-American	6.2	5.3	1.5	5.5	5.3	2.7
Other	49.7	24.8	70.4	39.2	19.5	34.7
Unknown	14.9	18.4	13.0	20.1	15.2	28.1
Enrollment Duration (Months)						
1-6	21.1	13.5	27.1	30.6	13.3	38.9
7-12	18.7	13.9	24.9	20.9	14.7	30.6
13-18	11.4	9.0	14.7	10.9	7.7	12.1
19-24	9.4	9.2	9.9	8.1	7.7	5.6
25+	39.5	54.5	23.3	29.5	56.7	12.8
Enrollment Year						
1987 or earlier	36.4	50.0	23.9	36.7	49.5	30.4
1988	13.0	11.5	12.0	15.2	10.1	17.7
1989	12.4	6.0	12.9	12.0	9.4	14.4
1990	11.7	6.6	14.5	11.1	9.8	13.8
1991	13.3	11.3	19.1	12.5	10.1	12.1
1992	13.2	12.5	17.5	12.5	11.1	11.7
Enrollment Pattern						
Continuous	59.5	72.5	48.1	54.6	71.0	58.8
Discontinuous	31.3	16.6	32.5	35.5	20.8	30.9
Switch to FFS	3.9	7.4	7.8	3.3	5.0	1.6
Discon. & FFS	**5.4**	**3.5**	**11.6**	**6.6**	**3.2**	**8.8**

Table 2-2c: Percentage Distribution of Demographic and Medicaid Enrollment Characteristics Among Medicaid Beneficiaries by Eligibility Group-Ventura

	AFDC Children	SSI Children	Other Children	AFDC Adults	SSI Adults	Other Adults
Number of Enrollees	65.649	828	16,819	44,579	11,942	4,964
Age at Enrollment (years)						
0-2	40.2	13.2	61.1	- -	---	---
3-5	15.7	13.5	11.7	- -	---	---
6-17	44.1	73.3	27.2	---	---	---
18-24	- -	---	---	35.7	13.1	72.5
25-54	---	- -	---	62.4	56.3	26.6
55-64	---	---	---	1.8	30.6	0.9
Gender						
Male	49.3	59.4	50.7	23.9	51.6	19.5
Female	50.7	40.6	49.3	76.1	48.3	80.5
Race						
White	27.9	48.8	17.0	28.2	56.7	28.3
African-American	3.9	5.6	1.0	2.9	3.8	1.0
Other	52.0	26.1	67.0	48.2	22.3	53.3
Unknown	16.2	19.6	14.9	20.7	17.2	17.4
Enrollment Duration (Months)						
1-6	25.1	11.6	38.6	34.5	15.7	48.2
7-12	20.9	21.7	23.0	23.8	16.5	32.4
13-18	11.0	6.6	12.2	11.1	7.8	9.5
19-24	9.2	10.0	8.5	7.7	9.7	4.3
25+	33.9	50.0	17.6	22.9	50.4	5.6
Enrollment Year						
1987 or earlier	35.7	49.2	19.0	33.9	50.7	14.2
1988	10.5	9.5	10.2	11.2	8.8	8.2
1989	11.8	12.8	12.4	12:4	9.8	13.4
1990	12.5	7.7	11.5	13.0	9.1	7.1
1991	14.6	10.3	23.4	14.4	10.1	32.1
1992	14.9	10.5	23.4	15.1	11.6	25.0
Enrollment Pattern						
Continuous	66.3	74.3	66.4	65.8	82.6	74.1
Interrupted	33.7	25.7	33.6	34.2	17.4	25.9

SSI enrollees have uniformly longer enrollment durations relative to AFDC and Other enrollees. In addition, other enrollees, driven by Medicaid expansions, were enrolled disproportionately in more recent years than SSI and AFDC enrollees. Note that to be in our data set beneficiaries had to be enrolled sometime during the 1987 to 1992 period. Hence, all beneficiaries in our data set first enrolled in 1982, by meeting the inclusion criteria, had to be long-term enrollees. Thus, the average months enrolled for 1982- 1986 enrollees is significantly longer than 1987- 1992 enrollees.

Table 2-3: Average Enrollment Duration and Distribution of Enrollees by Year of Initial Observation, Ail Counties by Eligibility Group

	AFDC		SSI		Other	
	Average Months Enrolled	Proportion of Total Enrollees	Average Months Enrolled	Proportion of Total Enrollees	Average Months Enrolled	Proportion of Total Enrollees
1982†	99.0	10.1	118.7	10.0	89.7	2.5
1983†	80.9	2.2	97.6	0.9	71.9	0.8
1984†	68.5	2.8	84.4	1.4	56.4	1.2
1985†	53.8	3.8	70.6	1.7	40.7	1.7
1986†	36.6	7.5	54.8	2.5	28.9	4.9
1987	28.3	15.7	42.6	37.4	19.5	11.3
1988	20.7	12.3	30.8	9.5	16.0	13.0
1989	18.8	10.7	26.8	8.9	14.4	14.0
1990	15.8	10.2	21.6	8.6	14.0	13.4
1991	11.8	11.7	14.8	8.8	10.8	18.3
1992	5.5	13.1	6.5	10.4	4.7	19.0

†Enrollees first enrolled in years 1982-1986 were also enrolled in 1987; hence their average months enrolled is noticeably longer than persons first enrolled from 1987-1992.

3. Research Questions

Our study of MMC in California is aimed at addressing the relative success of MMC versus FFS in achieving the following goals: (1) improving access to primary health care over time, (2) promoting the use of preventive care services over time, (3) changing patterns of service utilization over time, and (4) controlling health care expenditures over time. We examine the research questions associated with the goals in turn.

3.1 Improving Access to Primary Health Care

Access to care measures derived from administrative claims data are at best indirect measures of access. In general, access to care is affected by a great many unobserved factors such as community outreach efforts, patient education, the strength of the PCP-patient relationship, and cultural and individual characteristics. However, certain observable changes in health care patterns may be used to infer improved access.

We expect to observe a higher level of ambulatory care within the MMC counties with respect to the FFS control county. While not necessarily indicative of improved access to care, greater contact with physicians on an outpatient basis is generally consistent with the goals of managed care, which in part is the early identification and prevention of illness.

Lower rates of ER care are also consistent with improved access to care. ER care is the traditional provider of last resort for the poor. We hypothesize that with successful MMC we will observe a decreased rate of ER care relative to FFS, and a decreasing rate of ER care over time relative to FFS.

Finally, we hypothesize that improved access to care will be manifested in the form of reduced occurrence over time of hospitalizations for ambulatory care sensitive conditions (ACSCs). Examples of such conditions are congenital syphilis and bacterial pneumonia. A complete list of the conditions is provided in Appendix A.

3.2   Promote Preventive Care

One of the promises of managed care is that it will encourage the use of preventive care, Claims data allow us to gauge the extent to which specific preventive measures were undertaken by enrollees of MMC and in turn compare rates of preventive care to FFS enrollees. Specifically, we investigated the occurrences of well-child visits and immunizations among children. The American Academy of Pediatrics (AAP) recommends that children receive well-child visits at specific age intervals throughout early childhood: at birth and at 2, 4, 6, 9, 12, 15, 18, and 24 months of age and annually through age 5 years. In addition, children are recommended to receive the diphtheria-tetanus-pertussis (DTP) vaccine series at 2, 4, and 18 months of age; the oral polio vaccine (OPV) series at 2, 4, and 18 months of age; and the measles, mumps, and rubella (MMR) vaccine at 15 months of age. We investigated and compared the rates of well-child visits and immunizations-both the proportion of children who received any and the proportion who were compliant with AAP recommendations-between MMC and FFS among children continuously enrolled from birth.

We also investigated the extent to which women of child-bearing age (18 to 39 years) received annual pap smears. As with preventive care for children, we examined rates of compliance with recommended standards for non-delivery-related pap smears among continuously enrolled women. In general, we hypothesized that enrollees in managed care would exhibit greater compliance with recommended preventive care guidelines.

3.3   Changes in Patterns of Service Use

One of the widely held beliefs of managed care is that early and continuous primary and preventive care leads to a reduction in duplicate, unneeded, or marginally useful care. Services where we may see a reduction include laboratory and radiology services, medications, and hospital inpatient days. We hypothesized that the managed care counties would exhibit lower rates of laboratory and radiology examinations, medications, and inpatient days relative to FFS.

It is worth noting, however, that new enrollees may have a large amount of unmet need, and as a result initially may have higher levels of such care. Our multivariate models allowed us to examine the year-by-year program effects associated with managed care.

Table 2-4: Measures Used to Examine Success of Managed Care in Achieving Specific Goals

	Access	Preventive Care	Patterns	Cost Controls
Any ambulatory care use	X		X	
Number of ambulatory days of care	X		X	
Number of ER visits	X		X	
Number of ambulatory care days with lab/radiology services			X	
Compliance with annual pap smear	X	X		
Compliance with well-child visits schedule	X	X		
Compliance with childhood immunizations schedule	X	X		
Any medications			X	
Number of medications			X	
Any surgery hospitalizations			X	
Number of surgical hospital days			X	
Any medical hospitalizations			X	
Number of medical hospital days			X	
Number of delivery-related hospital days			X	
Any hospitalization for ACSCs	X			
Mean overall monthly Medicaid payments				X

3.4   Control Health Care Expenditures

In addition to changing aspects of care utilization, managed care may result in lower spending levels. An open question to date has been how the ability to control spending changes over time. If the managed care efforts to improve access to primary care, promote preventive care, and change patterns of utilization are successful, a lower rate of expenditure may follow. However, because short-term effects may embody the backlog of health care needed among enrollees it may only be possible to observe such effects over a suitably long period of time, which is the strength of our study design. All **expenditures are measured in real dollars based on** the 1983 Medical Care Component of the Consumer Price Index.

4. Methodology

Because of the richness of the longitudinal data for California, we were able to use more sophisticated estimation techniques then the traditional pre-post/cross-section program effect design used for the other three states in the evaluation. Specifically, **Medi-Cal** outcomes data are observed on a monthly basis for each individual over the 72 months during the **years** 1987 through 1992. All individuals, however, are not enrolled during the entire 72-month period; if we were to restrict the sample to continuously enrolled individuals, our sample would be comprised of a highly nonrepresentative group of persons, and our inferences would only be generalizeable to long-term enrollees. Our multivariate methods must be general enough to infer the effect of managed care from individual data observed longitudinally for different lengths of time.

4.1 Descriptive Analysis

For the descriptive analysis, we stratified the study 'population into six groups: (1) AFDC children, (2) SSI children, (3) other children, (4) AFDC adults, (5) SSI adults, and (6) other adults. We used under 18 years of age as the definition of children. In the analysis of the service use and expenditure measures, we first examined the rate of any use of the particular service at the monthly level, and then the monthly level of use among users of the service. The rates and levels of use are compared across the three counties for each of the six years in the study period.

4.2 Multivariate Analysis

The goal of the multivariate analysis was to estimate the relationship between enrollment in a county organized health plan and the outcomes of interest described in Section 3, controlling for other person-level factors and also controlling for the fact that different persons were enrolled for different periods of time. Because we observed the same individuals over time we were able to control for the likelihood that individual-specific idiosyncratic factors were correlated across observations for the same individual. In more technical terms, we estimated a random-effects unbalanced panel data model.

Our basic multivariate framework is specified as follows:

$$Outcome_{it} = f\,(\alpha\, d_{it} + \beta^B\, e^B_{it} + \beta^{BY}\, d_{it}\, e^B_{it} + \beta^M\, e^M_{it} + \beta^{MY}\, d_{it}\, e^M_{it} + \gamma\, X_{it} + \delta\, y_{it} + \mu_i + \epsilon_{it})$$

for all $i = 1$ to N and $t = \tau_i$ to T_i, where

- $Outcome_{it}$ represents the outcome of interest for person i during month t

- d_{it} represents a vector of 10 indicator variables reflecting-the number of **months** up to and including period t enrolled in one of the three plans in **12-month intervals.**[3] The purpose of the enrollment duration indicator variables is to control for the likely dependence between time enrolled and need for care. For example, if newly enrolled individuals have

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[3] The technique of breaking a continuous variable (months enrolled to date) into linear segments of equal length is known in the econometrics literature as a linear spline regression. For example, if a person-month observation is for a person who had been enrolled in the plan for 15 months up to the point in time represented by the record, then $d_{it} = [1, 0, 0,\ 0, 0, 0, 0, 0, 0, 0]$, indicating that relative to the initial 12 months of enrollment the person was enrolled between 13 and 24 months (the 1 in the first element of the vector).

a large amount of unmet need for health care services, utilization is expected to be high initially. However, as patients are enrolled for longer periods of time, one expects care needs to diminish relative to the initial period. Note that for San Mateo enrollees the indicator variables representing prior enrollment from 73 to 132 months were omitted.

- e^B_{it} and e^M_{it} represent indicators for whether person i was enrolled in the Santa Barbara and San Mateo County organized health plans during month t. Persons enrolled in Ventura County's FFS program **always** had a value of zero for e^B and e^M.

- β^B and β^M represent the (monthly) impacts on the outcome variable from enrollment in the Santa Barbara and San Mateo County organized managed care plans relative to enrollment in Ventura County's FFS program. β^{BY} and β^{MY} represent vectors of coefficients for interaction terms that (in conjunction with β^B and β^M) allow for a decomposition of the program effect into a series of coefficients representing how the effect of managed care evolved depending on enrollment duration for each county. For example, β^B represents the first-year impact of enrollment in SBHI, while β^B plus the first element of β^{BY} represents the effect of enrollment in SBHI for 13 to 24 months. The hypotheses under consideration will be judged on the basis of these coefficients.

- γ represents a vector of parameters associated with person-level covariates.

- X_{it} represents a vector of person-level covariates, including race and sex indicators and age at enrollment.

- α represents a vector of five parameters associated with each year of the analysis period (the first year of the study period, 1987, is the excluded category).

- y_{it} represents a vector of five indicator variables reflecting the year during which the current observation's utilization occurs. The purpose of the yearly indicator variables is to control for state-wide or national factors that might influence outcomes in all counties under consideration.

- μ_i represents a person-specific random variable capturing unobserved differences in health status and propensity to utilize particular services.

- ϵ_{it} represents idiosyncratic, unobserved factors that affect outcomes.

Note that each individual's variables are observed over a potentially different time period, hence t runs from τ_i to T_i. For example, persons observed continuously from January, 1987 to December 1992 have $\tau_i = 1$ and $T_i = 72$. Given the size of the data set, virtually all possible combinations of τ_i and T_i *are* observed. Such data are known as unbalanced; our random effects model has been adjusted to handle unbalanced data.

An important assumption underlies our model. We assume that the unobserved factors affecting the disenrollment process are uncorrelated with unobserved factors affecting the outcome variable. In technical terms, we assume ignorable or non-distortionary attrition. That

is, enrollees drop out of the sample for reasons that are not related to their health care utilization. A more appropriate model, which is beyond the scope of this report, would estimate the factors affecting outcomes while simultaneously controlling for the probability that the individual remains enrolled in the current period.

In summary, our primary multivariate model controls for race, age, gender, and eligibility group as they represent important control variables in our examination of managed care in the Medi-Cal program (Table 2-5). Race is observed as white, African American, other, and unknown; other in California is largely comprised of Hispanics and Asians. Age is generally measured as age at initial enrollment or first appearance with the data set. We use eligibility group as a stratification variable to separately examine AFDC, SSI, and other enrollees. However, the most critical analysis variable in California is time: we control for calendar time with year dummies.[4] We also control for enrollment duration through a series of indicators representing 12-month periods of prior enrollment; we then interact the enrollment duration indicators with the program enrollment variables to decompose the effect of MMC over different stages of an enrollee's enrollment history.

Table 2-5. Independent Variables for the Regression Analyses

Demographic variables:
- age,
- gender, and
- race/ethnicity (white, African American, other and unknown).

Medicaid eligibility and enrollment variables:
- dichotomous variables (linear splines) for the consecutive 12-month periods of enrollment in the Medicaid plan (measured back to 1982 for SBHI and Ventura FFS and to 1987 for HPSM);
- eligibility category (AFDC cash assistance; SSI cash assistance; and other non-cash categories); and
- dichotomous variables for calendar year of service use.

Program variables:
- indicator variables for enrollment in SBHI and HPSM, respectively;
- interaction terms between the plan enrollment and the duration of enrollment splines.

For several outcome variables, we were unable to apply longitudinal techniques because the events measured were conditional upon the occurrence of another event that need not have occurred at regular intervals. These outcomes are length of hospital stay (medical or surgical and delivery stays), compliance with well-child visit and immunization recommendations, and compliance with pap smear recommendations. In these instances we estimate ordinary least squares (OLS) or, when the outcome is binary, logistic regressions wherein yearly'indicator

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[4] We experimented with monthly dummies but found that the results differed little from the results including year dummies.

variables interacted with county enrollment indicators are the central measure of the effect of MMC.

43 Limitations

Several caveats are important to bear in mind throughout this report. First, our research does not represent a controlled trial of the efficacy of managed care in the Medi-Cal system. While our study is among the first to examine the longitudinal impact of MMC, our results represent observational differences in patterns of service use over time between three counties; no attempt is made to understand the underlying managed care features and attributes (e.g. utilization review, physician profiling, etc.) that may be driving observed differences.

Second, the issue of state dependence -that prior attributes, utilization, **and** care management techniques may impact current cost and utilization-cannot be directly controlled for in our study. Put differently, there is no benchmark or reference period upon which we gauge year-by-year MMC program effects. However, we partly solve the issue of state dependence by allowing current utilization to be a function of prior enrollment duration in managed care or FFS. Thus, our estimates allow individuals to serve in part as their own controls.

Third, we ignore the impact of discontinuities of enrollment. While disruptions in an enrollment spell are likely to have an impact on utilization, a model that considers the impact of a disruption in enrollment is beyond the scope of this report. Similarly, a more general panel data model might include an autoregressive component in the error term of the regression specification. In other words, past use of service may presage future use. To the extent that such individual heterogeneity is not captured by the person-specific error term, we ignore such complexities out of the interest of parsimony.

Fourth, under-reporting of pseudo-claims is always possible in claims-based studies of **capitated** managed care programs. In general managed care organizations have lower incentives to track utilization at the detailed event level relative to FFS plans. In our previous Medicaid Competition Demonstration Evaluation, we estimatea under-reporting to be between 5 and 15 percent (RTI, 1989). However, Santa Barbara and San Mateo both have a long history of accurate and timely reporting of medical care claims. In addition, it is possible that if managed care providers use pseudo-claims to petition the state for increased **capitation** levels, providers may have an incentive to accurately report (or perhaps over-report) utilization. Nonetheless, in some years for some eligibility groups, anomalous unexplained discrepancies in total utilization appeared in relation to previous and subsequent years. They include: 1988 enrollees in Santa Barbara, 1990 SSI enrollees in San Mateo and Ventura, and 1990 other enrollees in Ventura. In addition specific services in some counties appeared to have limited reporting during particular years. They include: laboratory and radiology services in Santa Barbara from 1987 to 1990, and medications in Santa Barbara from 1987 to 1988. The source of the discrepancies is unknown, but they are relatively obvious from the descriptive statistics and can be **controlled** for in multivariate analyses with annual program interaction effects.

Finally, because of the large size of the data set it was necessary for computational practicality to take random subsamples from the full sample for the largest **eligibility** groups in

estimating the multivariate models. A 25 percent random subsample was taken for **AFDC** adults, SSI adults, and Other children, and 12.5 percent random subsample was taken for AFDC children. In several cases we estimated models based on the full sample in order to make comparisons to the random subsamples, and found minimal variation in the **results.** Thus, we are confident that little was lost in the reduced sample estimates.

5.   Results

Because the county organized managed care efforts are likely to have a diffferent impact on enrollees based on eligibility group, we present results separately for AFDC enrollees, SSI enrollees, and Other enrollees **(SOBRA,** Ribicoff kids, etc.). Within each subsection, we further subdivide results based upon whether the enrollee is an adult or a child using 18 years of age as the cutoff. Full regression results are provided in Appendix C.

5.1 AFDC Enrollees

The population of AFDC enrollees is generally comprised of lower-income women and children who were eligible for federal cash assistance or food stamp subsidies through the Aid to Families with Dependent Children program. In general, eligibility for **AFDC** guarantees Medicaid eligibility.

51.1 Access **to Care**

As mentioned in Section 3, we attempt to infer differences in access to care by investigating the differences in patterns of ambulatory care use, as well as hospitalizations for conditions that are generally preventable through ambulatory care. We first examine total outpatient care use for AFDC adults and children, then we examine the differences in setting of ambulatory care over time in the three counties. Next, we examine the incidence and extent of emergency room (ER) care. Finally, we investigate rates of hospitalization for **ACSCs.**

Total Ambulatory Care. For **AFDC** children, the descriptive statistics reveal an upward trend in use of ambulatory care (Table 2-6) over time in all counties. However, **the** trends in utilization for the managed care counties were not enough to eclipse the initial county differences in children's service use over time. Interestingly, Ventura County has a consistently higher rate of ambulatory medical events for children compared to San Mateo and Santa Barbara Counties.

For adults, Ventura County also had a higher average level of service use relative to San Mateo and Santa Barbara Counties. However, the descriptive and multivariate results show an upward trend in ambulatory care use for San Mateo enrollees and a downward trend in service use for Ventura enrollees. **Large** service use differences are apparent between Santa Barbara and Ventura counties.

Table **2-***i* presents multivariate random effects **probit** results for the probability of experiencing any ambulatory care during a given month. Table 2-8 presents multivariate results for the number of monthly ambulatory visits. Those results, which control for the effects of

**Table 2-6: Percentage of Enrollee-Months with at Least One Ambulatory Care Day
and Number of Ambulatory Care Days per Month Among Users Over Time
for AFDC Adults and Children**

	AFDC Children			AFDC Adults		
	San Mateo	Santa Barbara	Ventura	San Mateo	Santa Barbara	Ventura
Percentage of Enrollee-Months with Ambulatory Care						
1987	13.6	13.4	21.5	19.4	21.0	33.5
1988	16.1	4.7-f	21.9	25.0	9.8-t	33.4
1989	18.1	18.2	23.5	27.1	29.2	32.3
1990	18.9	17.3	22.2	27.3	24.5	31.3
1991	20.3	17.1	22.0	28.2	21.3	30.9
1992	20.7	17.3	24.7	29.1	20.6	34.3
Mean Number of Ambulatory Care Days per Month Among Enrollees with Events						
1987	1.41	1.31	1.52	1.77	1.56	2.00
1988	1.48	1.33	1.53	1.79	1.61	2.07
1989	1.47	1.38	1.49	1.83	1.70	2.03
1990	1.45	1.36	1.48	1.77	1.66	1.94
1991	1.48	1.39	1.50	1.83	1.71	2.00
1992	1.49	1.40	1.57	1.91	1.72	2.05

† The discrepancy is likely due to reporting anomalies during the year.

managed care effect over time enrolled for AFDC adults suggests that the managed care counties had significantly lower levels of ambulatory care throughout all durations of enrollment. The effect of managed care for adults over time remained relatively stable for Santa Barbara enrollees with the exception of very long-term enrollees, while differences between San Mateo and Ventura adults appeared to narrow somewhat over time, again with the exception of long-term enrollees. For AFDC children, the number of monthly ambulatory care days was significantly lower in the initial years of enrollment in the managed care counties, but appeared to equalize and, in the case of Santa Barbara children, become significantly higher among long-term enrollees.

Setting **of Cure.** Table 2-9 displays the differences in setting of care between the three counties. Note that outpatient department visits were much more common in San Mateo and Ventura counties. The growth in the Other/Unknown category was likely due to the changes in reporting of EPSDT visits over time, as discussed in Section 2, which were frequently recorded in claims with an unknown care site. Interestingly, both San Mateo and Ventura Counties were able to decrease the relative dependence on the ERs for ambulatory care over time:, while in Santa Barbara County the proportion of ambulatory care received in the ER stayed roughly constant over time (Table 2- 10).

Table 2-7: Random Effects (Probit) Results for the Occurrence of a Monthly Ambulatory Medical Event, AFDC Children and Adults

	Random Effects Probit Results	
Months	Some Managed Care	Same County
AFDC Children† (patients = 16,716, obs = 376,820)		
1-12	-0.039**	-0.039**
13-24	-0.038**	-0.045**
25-36	-0.023**	-0.035**
37-48	-0.022**	-0.023**
49-60	-0.028**	-0.005
61-72	-0.018	0.019
73-84	----	0.019*
85-96	- -	0.077**
97-108	----	0.079**
109-120	----	0.057**
121-132	----	0.045**
AFDC Adults‡ (patients = 21,802, obs = 386,410)		
1-12	-0.054**	-0.122**
13-24	-0.047**	-0.119**
25-36	-0.057**	-0.116**
37-48	-0.029**	-0.125**
49-60	-0.038**	-0.131**
61-72	-0.113**	-0.134**
73-84	----	-0.129**
85-96	----	-0.037**
97-108	----	-0.029**
109-120	----	-0.094**
121-132	----	-0.142**

Note: Estimated effects are relative to Ventura **County.**
§ Results displayed are marginal (probability) effects based on mean values of regressors.
† Multivariate results based on 12.5% random sub-sample of patients.
‡ Multivariate results based on 25% random sub-sample of patients.
* indicates statistically significant difference at the 0.01 level.
** indicates statistically significant difference at the 0.001 level.

Table 2-8: Multivariate Results for the Number of Monthly Ambulatory Medical Events, AFDC Children and Adults

Months	Random Effects Result	
	San Mateo	Santa Barbara
AFDC Children? (patients = 16,716, obs = 376,820)		
1-12	-0.089**	-0.138**
13-24	-0.077* *	-0.100**
25-36	-0.037**	-0.079**
37-48	-0.030**	-0.059**
49-60	-0.031**	-0.022
61-72	-0.029	0.017
73-84	----	0.028*
85-96	----	0.084**
97-108	----	0.080**
109-120	----	0.063**
121-132	----	-0.061*
AFDC Adults‡ (patients = 21,802, obs = 386,410)		
1-12	-0.154**	-0.295**
13-24	-0.124**	-0.257**
25-36	-0.147**	-0.251**
37-48	-0.070* *	-0.303**
49-60	-0.095**	-0.315**
61-72	-0.259* *	-0.314**
73-84	----	-0.266**
85-96	----	-0.114**
97-108	----	-0.120**
109-120	----	-0.275**
121-132	----	-0.384**

Note: Estimated effects are relative to Ventura County.
† Multivariate results based on 12.5% random sub-sample of patients.
‡ Multivariate results based on 25% random sub-sample of patients.
* indicates statistically significant difference at the 0.01 level.
** indicates statistically significant difference at the 0.001 level.

Table 2-9: Percentage Distribution of Monthly Ambulatory Care Days by Setting of Care, Over Time, AFDC Adults and Children

	Office	Outpatient Department	Emergency Room	Other/Unknown
San Mateo				
1987	50.3	28.0	16.6	5.1
1988	53.8	24.5	15.0	6.7
1989	47.1	18.8	13.7	19.5
1990	46.6	20.0	13.6	18.8
1991	46.4	20.7	14.1	18.4
1992	47.9	19.9	13.9	17.8
Santa Barbara				
1987	77.8	6.6	12.4	3.2
1988	69.8	9.1	13.3	7.8
1989	67.3	5.7	11.1	15.9
1990	62.0	6.1	12.4	19.5
1991	59.4	5.8	13.5	21.3
1992	59.5	5.8	13.2	21.5
Ventura				
1987	57.5	26.9	13.7	2.0
1988	53.2	28.8	14.0	4.0
1989	47.3	29.0	13.1	9.2
1990	44.1	30.0	13.1	11.3
1991	45.0	30.4	12.9	10.3
1992	37.8	31.9	11.9	10.2

Table 2-10: Percentage of Enrollee-Months with at Least One Emergency Room Visit and Number of Emergency Room Visits per Month Among Users Over Time, AFDC Adults and Children

	AFDC Children			AFDC Adults		
	San Mateo	Santa Barbara	Ventura	San Mateo	Santa Barbara	Ventura
Percentage of Enrollee-Months with an ER Visit						
1987	2.5	2.1	4.1	5.0	3.4	5.6
1988	2.9	0.8†	4.4	5.5	1.5†	5.6
1989	3.1	3.1	4.2	5.4	4.6	5.7
1990	3.1	3.2	4.0	5.5	4.5	5.4
1991	3.7	3.2	4.1	5.7	4.7	4.9
1992	3.7	3.2	4.4	6.1	4.6	5.0
Mean Number of ER Visits per Month Among Enrollees with Events						
1987	1.12	1.10	1.26	1.20	1.18	1.47
1988	1.20	1.07	1.27	1.28	1.13	1.46
1989	1.21	1.10	1.26	1.29	1.17	1.41
1990	1.16	1.12	1.25	1.22	1.1'7	1.34
1991	1.14	1.12	1.25	1.21	1.21	1.33
1992	1.16	1.13	1.24	1.24	1.21	1.35

The discrepancy is likely due to reporting anomalies during the year.

Multivariate models, displayed in Table 2-11, suggest that ER visits were generally lower among AFDC adults and children, but the effect dissipated with time enrolled in managed care. In particular, notice that AFDC adults in Santa Barbara had significantly fewer ER visits throughout the first six years of enrollment, but some long-term enrollees had significantly more ER visits relative to Ventura adults enrolled in FFS Medicaid for equally long durations. The. results for AFDC children showed a consistent negative association between managed care and ER use, though the effect appeared to become smaller over time. The findings are somewhat surprising as we anticipated managed care would lead to increasingly lower levels of ER care over time relative to FFS. The results could indicate that the initial impact of managed care is a reduction in ER visits, but over time traditional FFS enrollees are also successful in limiting the use of ER care.

Table 2-11: Multivariate Regression Results for the Number of Emergency Room Visits per Month Among Users Over Time, AFDC Adults and Children

Months	Random Effects Results	
	San Mateo	Santa Barbara
AFDC Children† (patients = 16,716, obs = 376,820)		
1-12	-0.018**	-0.029**
13-24	-0.014**	-0.023**
25-36	-0.009**	-0.018**
37-48	-0.006**	-0.016**
49-60	-0.0006	-0.006**
61-72	-0.002	-0.006**
73-84	----	-0.004
85-96	- -	-0.014**
97-108	- -	-0.003
109-120	----	0.002
121-132	----	-0.016**
AFDC Adults* (patients = 21,802, obs = 386,410)		
1-12	-0.0006	-0.033**
13-24	-0.002	-0.027**
25-36	-0.007**	-0.024**
37-48	-0.010**	-0.026**
49-60	-0.001	-0.021**
61-72	-0.020*	-0.015**
73-84	----	-0.004
85-96	----	0.004
97-108	----	0.025**
109-120	----	0.018**
121-132	----	0.010

Note: Estimated effects are relative to Ventura County.
† Multivariate results based on 12.5% random sub-sample of patients.
‡ Multivariate results based on 25% random sub-sample of patients.
* indicates statistically significant difference at the 0.01 level.
** indicates statistically significant difference at the 0.001 level.

Hospital Stays for Ambulatory Care Sensitive Conditions. Table 2- 12 displays
descriptive results for the rates of ACSC hospitalizations over time. The results suggest that
hospitalizations for ACSCs were relatively common: more than a third of all non-(delivery
related hospitalizations in the three counties were for ACSCs. Table 2-12 also suggests that the
relative proportion of ACSC hospitalizations among ail hospitalizations rose over rime for all
groups but San Mateo children. However, the apparent trend could be due to reduced rate of
hospitalizations overall. Nonetheless, multivariate results in Table 2-13 indicate that ACSC
hospitalizations were slightly but significantly more probable for adult AFDC managed care
enrollees. Results in Table 2-13 also indicate that there was no significant difference in the
occurrence of ACSC hospitalizations for AFDC children. While making inferences regarding
access to care issues is dubious, our results for ACSCs are suggestive of the need for closer
doctor-patient contact, particularly under managed care.

**Table 2-12: Percentage of Enrollee-Months with at Least One Hospitalization
for ACSC and Percent of Non-Delivery-Related Hospitalizations for ACSCs
per Month Over Time, AFDC Adults and Children**

	AFDC Children			AFDC Adult		
	San Mateo	San Barbara	Ventura	San Mateo	San Barbara	Ventura
Percentage of Enrollee-Months with a Hospitalization for ACSC						
1987	0.1	0.1	0.1	0.3	0.2	0.2
1988	0.1	0.0	0.1	0.3	0.1	0.3
1989	0.1	0.1	0.1	0.3	0.3	0.2
1990	0.1	0.1	0.1	0.3	0.3	0.2
1991	0.2	0.1	0.1	0.3	0.3	0.2
1992	0.1	0.1	0.1	0.3	0.3	0.2
Percentage of Non-Delivery-Related Hospitalizations for ACSCs						
1987	42.4	33.3	34.9	29.3	23.4	24.0
1988	44.4	27.9	32.3	31.6	25.1	34.1
1989	44.3	31.6	33.0	34.6	29.8	32.5
1990	37.2	35.1	37.0	32.9	25.5	31.1
1991	42.8	38.2	36.9	32.6	29.7	30.1
1992	42.1	37.7	40.2	34.2	28.7	30.9

5.1.2 Preventive Care

Well-Child Visits. Table 2-14 displays rates of well-child visits for continuously enrolled
AFDC children at 6, 12, and 24 months of age. We define full compliance with the AAP
recommendations for the number of health supervision visits as 3 visits in the first 6 months of
life, 5 visits in the first 12 months of life, and 8 visits in the first 24 months of life. Our
compliance criterion allows for some leniency from the recommendations because children often
do not receive their own identification number for several weeks after birth. As a result, their
early utilization information from claims files may not be attributed to them.

Table 2-13: Random Effects (Probit) Results for the Occurrence of a Monthly ACSC Hospitalization, AFDC Children and Adults

Months	Random Effects Probit Results	
	San Mateo	Santa Barbara
AFDC Children? (patients = 16,716, obs = 376,820)		
1-12	-0.00000	-0.00002
13-24	-0.00001	-0.00001
25-36	-0.00001	-0.00003
37-48	0.00002	-0.00002
49-60	0.00000	-0.00004
61-72	-0.00024	0.00004
73-84	----	0.00004
85-96	---	-0.00003
97-108	----	0.00002
109-120	----	0.00006
121-132	----	0.00007
AFDC Adults* (patients = 21,802, obs = 386,410)		
1-12	0.0003**	0.0002**
13-24	0.0004**	0.0002
25-36	0.0003	0.0003
37-48	0.0004	0.0003
49-60	0.0002	0.0002
61-72	0.0004	0.0000
73-84	- -	0.0000
85-96	----	0.0005
97-108	----	0.0003
109-120	----	0.0005
121-132	----	0.0001

Note: Estimated effects are relative to Ventura County.

§ Results displayed are marginal (probability) effects based on mean values of regressors.

† Multivariate results based on 12.5% random sub-sample of patients.

‡ Multivariate results based on 25% random sub-sample of patients.

* indicates statistically significant difference at the 0.01 level.

** indicates statistically significant difference at the 0.001 level.

The results suggest that Santa Barbara had a markedly lower percentage of children with no health supervision visits and a higher rate of compliance with AAP recommendations relative to San **Mateo** and Ventura counties. Interestingly, San Mateo and Ventura results appeared similar in the earlier years, but diverged over time as preventive care use among children improved in Ventura County. Ventura County AF'DC children became more compliant with AAP recommendations, while the San Mateo plan appeared to be unsuccessful in noticeably improving compliance rates for well-child visits over time. These findings are borne out in the multivariate results shown in Table 2-15.

Table 2-14: Compliance with the AAP Schedule of Health Supervision Visits Among Continuously Enrolled Medicaid Children by Age and Year, AFDC Enrollees

		San Mateo			Santa Barbara			Ventura	
Year	N	% No. Visits	% Full Compliance	N	% No. Visits	% Full Compliance	N	% No. Visits	% Full Compliance
At 6 Months of Age[1]									
1989	601	32.7	7.0	540	14.3	19.3	844	35.2	8.9
1990	901	33.6	9.0	715	18.0	12.6	1307	33.7	11.7
1991	1299	36.6	9.4	959	19.1	12.6	1814	28.6	12.1
1992	1378	31.7	7.8	816	14.7	17.0	1621	21.0	16.2
All years	4180	33.8	8.4	3030	16.8	15.0	5586	28.6	12.7
At 12 Months of Age[2]									
1989	421	15.2	5.5	446	6.7	14.4	615	21.8	5.7
1990	630	17.0	6.8	596	9.1	7.1	1029	19.8	7.9
1991	923	15.7	6.7	789	5.5	8.8	1403	13.4	9.0
1992	364	13.7	3.3	162	4.3	6.2	400	10.3	8.3
All years	2338	15.7	6.0	1993	6.7	9.3	3447	16.4	8.0
At 24 Months of Age[3]									
1989	308	8.4	1.3	384	3.4	7.0	509	12.8	3.3
1990	425	9.9	4.7	479	3.1	3.3	778	7.7	3.7
1991	182	8.2	2.2	89	1.2	0.0	181	5.5	3.9
All years	862	9.1	3.1	952	3.0	4.5	1468	9.2	3.6

[1] Full compliance at 6 months of age is considered to be 3 visits.
[2] Full compliance at 12 months of age is considered to be 5 visits.
[3] Full compliance at 24 months of age is considered to be 8 visits.

Table 2-15: Marginal Odds Ratios for the Probability of Well-Child Visits for Continuously Enrolled AFDC Children

	6 Mo. Well Child Compliance	Any Well Child Visits At 6 Mos.	12 Mo. Well Child Compliance	Any Well Child Visits At 12 Mo.
San Mateo				
1989	0.816	1.167	1.028	1.708**
1990	0.781	1.038	0.914	1.285
1991	0.782	0.708**	0.755	0.890
1992	0.448**	0.584**	0.391**	0.754
Santa Barbara				
1989	2.470**	3.283**	2.801**	3.968**
1990	1.088	2.304**	0.883	2.424**
1991	1.053	1.707**	0.98 1	2.503**
1992	1.062	1.545**	0.728*	2.232**

* indicates statistical significance at the 5% level
** indicates statistical significance at the 1% level

For all counties, multivariate results (tabulated in Appendix B) indicate that African Americans and "other" racial groups (mostly Hispanics) were often significantly less likely to be compliant with AAP well-child visits and were more likely to receive no well-child care during the period of our study. However, many of the Hispanics were likely to be **undocumented** aliens for whom TIT claims did not exist because EPSDT services were paid for by state-only funds; one criterion for inclusion in the TIT data was that there was positive **Medi-Cal** payments.

Immunizations. The patterns of childhood immunizations mirrored the results for health supervision visits (Table 2- 16). Santa Barbara had the lowest percentage of children with no immunizations and the highest percentage of children with full compliance with the AAP recommendations for the number and timing of immunizations. While both San Mateo and Ventura improved over time, as seen with well-child visits, Ventura improved **most** dramatically. The multivariate results in Table 2-17 show the improvement in immunization **rates** in Ventura relative to both Santa Barbara and San Mateo.

Table 2-16: Compliance with the AAP Schedule of Childhood Immunizations Among Continuously Enrolled Medicaid Children by Age and Year, AFDC Enrollees

Year	San Mateo			Santa Barbara			Ventura		
	N	% No Shots	% Full Compliance	N	% No Shots	% Full Compliance	N	% No Shots	% Full Compliance
At 6 Months of Age'									
1989	602	35.9	27.2	540	16.9	47.2	844	41.9	26.4
1990	901	37.5	29.6	715	18.7	43.1	1307	35.7	31.6
1991	1299	38.3	28.6	959	19.4	47.8	1814	28.7	35.8
1992	1378	36.1	25.6	816	18.4	48.0	1621	22.4	44.7
All years	4180	37.1	27.6	3030	18.5	46.6	5586	30.5	36.0
At 12 Months of Age²									
1989	421	18.8	31.8	446	7.2	53.8	615	28.5	28.9
1990	630	21.3	29.5	596	8.9	48.7	1029	24.0	31.3
1991	923	19.3	31.0	789	7.5	50.4	1403	15.8	38.6
1992	364	15.7	37.6	162	7.4	59.3	400	10.3	47.8
All years	2338	19.2	31.8	1993	7.8	51.4	3447	19.9	35.8
At 24 Months of Age'									
1989	308	9.7	22.1	384	3.3	42.7	509	15.5	23.8
1990	425	9.9	26.1	479	2.7	42.2	778	10.0	26.0
1991	182	11.5	15.9	89	1.1	32.6	181	7.7	29.8
All years	915	10.2	22.7	952	2.7	41.5	1468	11.6	25.7

[1] Full compliance at 6 months of age is considered to be 2 DTP. 2 OPV, and 0 MMR immunizations.
[2] Full compliance at 12 months of age is considered to be 3 DTP, 2 OPV, and 0 MMR immunizations.
[3] Full compliance at 24 months of age is considered to be 4 DTP, 3 OPV, and 1 MMR immunizations.

**Table 2-17: Marginal Odds Ratios for the Probability of Immunizations
for Continuously Enrolled AF'DC Children**

	6-Month Immuniz. Compliance	Any Immuniz. At 6 Mos.	12-Month Immuniz. Compliance	Any Immuniz. At 12 Mos.	24-Month Immuniz. Compliance	Any Immuniz. At 24 Mos.
San Mateo						
1989	1.062	1.338**	1.187	1.866**	0.936	1.763**
1990	0.923	0.953	0.939	1.254	1.039	1.067
1991	0.727**	0.661**	0.729**	0.824	0.452**	0.650
1992	0.431**	0.519**	0.671**	0.638*	- -	----
Santa Barbara						
1989	2.500**	3.580**	2.865**	5.219**	2.413**	5.785**
1990	1.645**	2.409**	2.094**	3.236**	2.074**	3.973**
1991	1.639**	1.684**	1.622**	2.254**	1.119	7.327*
1992	1.148	1.281*	1.595	1.422		- -

* indicates statistical significance at the **5% level**
** indicates statistical significance at the **1% level**

Pap Smears. Results presented in Table 2- 18 show pap smear rates for women of child-bearing ages. In order to eliminate any confounding influences, women with deliveries were omitted from the measures. The results indicate that Ventura had a low but relatively higher rate of compliance with annual pap smears among AFDC women continuously enrolled during their first one and two years of enrollment. San Mateo County enrollees had slightly higher compliance rates compared to Santa Barbara, but both were significantly below Ventura. No county appeared to dramatically improve its pap smear compliance over time. Similar results were found in the multivariate analyses (Table 2-19). The results provide a striking contrast between our hypothesis that managed care would stress preventive care and show better rates of compliance versus FFS, and also contrast with the results for AF'DC children.

51.3 Patterns of Health Service Use

Laboratory and Radiology Services. The descriptive and multivariate results in Tables 2-20 and 2-2 1 show that laboratory and radiology utilization were markedly lower for AFDC adults and children in San Mateo and Santa Barbara relative to Ventura (though the Santa Barbara results should be discounted because of the apparent reporting problems from 1987 to 1990). The results appear to indicate that MMC was associated with consistently lower levels of laboratory and radiology services throughout the enrollment duration distribution, as hypothesized. However, the results do not show that managed care resulted in increasingly larger differences between FFS laboratory and radiology services.

Table 2-18: Percentage of Continuously Enrolled Women Aged 18-39 Years with a Pap Smear by Time Enrolled and Year, AFDC Adults

Year	Santa Barbara N	% No Pap Smears	% Full Compliance	San Mateo N	% No Pap Smears	% Full Compliance	Ventura N	% No Pap Smears	% Full Compliance
At 12 Months of Eligibility[1]									
1987	1029	80.5	19.5	982	78.9	21.1	2062	73.4	26.6
1988	211	81.5	18.5	461	80.9	19.1	344	80.5	19.5
1989	182	77.5	22.5	463	83.3	16.7	386	74.4	25.6
1990	237	81.9	18.1	483	82.9	17.1	424	75.9	24.1
1991	304	79.0	21.0	660	82.3	17.7	670	79.9	20.1
1992	79	79.8	20.2	128	77.8	22.2	212	75.5	24.1
All years	2042	80.2	19.8	2257	81.0	19.0	4098	75.5	24.5
At 24 Month of Eligibility[2]									
1987	705	73.5	4.1	517	64.9	11.6	1334	51.8	18.4
1988	132	53.8	10.6	185	68.7	11.7	177	56.5	15.8
1989	111	69.4	9.9	201	74.6	4.0	233	57.1	16.7
1990	151	72.2	10.6	164	72.0	7.9	241	55.2	15.8
1991	38	73.7	5.3	53	81.1	3.8	91	65.9	9.9
All years	1137	70.6	6.3	1120	69.0	8.8	2076	53.8	17.3

[1] Full compliance is 1 pap smear.
[2] Full compliance is 2 pap smears.

Table 2-19: Marginal Odds Ratios for the Probability of Pap Smear Compliance, Continuously Enrolled AFDC Women Aged 18-39 Years

	12-Month Pap Smear Compliance	24-Month Pap Smear Compliance
San Mateo		
1987	0.708**	0.636*
1988	0.906	0.483
1989	0.575**	0.240**
1990	0.618	0.444
1991	0.880	0.289
1992	0.736	----
Santa Barbara		
1987	0.639**	0.176**
1988	0.803	0.553
1989	0.820	0.537
1990	0.740	0.588
1991	1.028	0.716
1992	0.648	----

* indicates statistical significance at the 5% level
** indicates statistical significance at the 1% level

Table 2-20: Percentage of Enrollee-Months with at Least One Ambulatory Care Days with Laboratory and Radiology Services and the Number of Ambulatory Care Days with Laboratory and Radiology Services per Month Among Users Over Time, for AFDC Adults and Children

	AFDC Children			AFDC Adults		
	San Mateo	Santa Barbara	Ventura	San Mateo	Santa Barbara	Ventura
Percentage of Enrollee-Months with Ambulatory Laboratory/Radiology Services						
1987	3.3	0.1†	5.9	11.3	0.6†	18.4
1988	4.7	0.2†	5.6	14.3	1.4†	18.4
1989	4.5	0.7†	7.5	15.1	5.2†	18.2
1990	4.4	1.5†	7.3	15.6	5.8†	18.1
1991	4.7	4.1	7.2	16.2	12.6	18.0
1992	4.9	4.1	8.3	16.5	11.5	19.9
Mean Number of Ambulatory Care Days with Laboratory/Radiology Services						
1987	1.26	1.06	1.23	1.48	1.20	1.52
1988	1.22	1.16	1.26	1.45	1.40	1.53
1989	1.23	1.26	1.19	1.47	1.38	1.55
1990	1.25	1.16	1.19	1.44	1.25	1.48
1991	1.27	1.21	1.22	1.46	1.40	1.53
1992	1.25	1.22	1.25	1.50	1.38	1.69

† The discrepancy is likely due to reporting anomalies during the year.

Medications. The descriptive results presented in Table 2-22 show that San Mateo enrollees were less likely to have had any medications, but had more prescriptions when they were prescribed relative to both Santa Barbara and Ventura. Overall the multivariate results in Table 2-23 indicates that child enrollees in managed care received significantly lower levels of medications over the first six years of enrollment relative to Ventura, though in Santa Barbara among long-term enrollees the effect was reversed. For AFDC adults, managed care enrollment was generally associated with lower levels of medication. It is unclear from the results whether managed care reduced the number of prescriptions due to eliminating prescriptions for marginally ill enrollees or whether managed care providers were more in tune with the needs of the enrollees and were better able to target the correct medicine to persons in need.

Hospital Stays. In our examination of hospital stays, we distinguish between hospitalizations for surgery, delivery-related hospitalizations, and hospitalization for "medical" reasons (i.e. non-surgical, non-delivery). The descriptive statistics in Tables 2-24 and 2-25 *are* difficult to interpret because inpatient admissions were relatively rare events, and length of stay was widely variable. However, the multivariate results in Table 2-26, which combine surgical and medical admissions, show that under managed care inpatient hospital admissions were significantly lower among newly enrolled persons, but increased in the later years of enrollment relative to FFS for AFDC adults and children. Table 2-27 shows results from an OLS regression of length of stay for surgical and medical hospitalizations. The results suggest that length of stay between the managed care counties and the FFS county did not differ statistically. In general, the results demonstrate the importance of examining utilization over a longer time horizon than has been the case in most prior research.

Table 2-21: Multivariate Regression Results for the Number of Monthly Ambulatory Care Days with Laboratory and Radiology Services, for AFDC Adults and Children

Months	Random Effects Results	
	San Mateo	Santa Barbara
AFDC Children? (patients = 16,716, obs = 376,820)		
1-12	-0.035**	-0.073**
13-24	-0.048**	-0.081**
25-36	-0.038**	-0.067**
37-48	-0.040**	-0.056**
49-60	-0.043**	-0.049**
61-72	-0.028**	-0.033**
73-84	----	-0.025**
85-96	----	-0.028**
97-108	- -	-0.002
109-120	----	0.025**
121-132	----	-0.031**
AFDC Adults* (patients = 21,802, obs = 386,410)		
1-12	-0.072**	-0.225**
13-24	-0.061**	-0.171**
25-36	-0.076**	-0.157**
37-48	-0.058**	-0.152**
49-60	-0.058**	-0.138**
61-72	-0.158**	-0.119**
73-84	----	-0.068**
85-96	----	-0.036**
97-108	----	0.014
109-120	----	0.025
121-132	----	0.043*

Note: Estimated effects are relative to Ventura County.
† Multivariate results based on 12.5% random sub-sample of patients.
‡ Multivariate results based on 25% random sub-sample of patients.
* indicates statistically significant difference at the 0.01 level.
** indicates statistically significant difference at the 0.001 level.

Table 2-22: Percentage of Enrollee-Months with at Least One Medication and the Number of Medications per Month Among Users Over Time, for AFDC Adults and Children

	AFDC Children			AFDC Adult		
	San Mateo	Santa Barbara	Ventura	San Mateo	Santa Barbara	Ventura
Percentage of Enrollee-Months with a Medication						
1987	9.0	9.2†	14.7	11.8	15.5†	24.5
1988	10.3	2.6†	14.8	16.4	4.1†	23.5
1989	8.5	13.9	14.6	14.7	21.8	20.7
1990	8.8	14.1	13.6	15.4	22.9	20.7
1991	9.6	15.2	13.9	15.0	23.2	20.0
1992	10.5	15.5	16.2	16.5	24.6	22.9
Mean Number of Medications per Month						
1987	2.12	1.44	1.87	2.39	1.92	2.13
1988	1.93	1.42	1.84	2.20	1.81	2.17
1989	1.94	1.52	1.93	2.35	2.01	2.16
1990	2.03	1.53	1.95	2.50	2.07	2.18
1991	2.24	1.61	2.02	2.75	2.22	2.26
1992	2.29	1.64	2.08	2.96	2.39	2.36

† The discrepancy is likely due to reporting anomalies during the year.

Table 2-23: Multivariate Regression Results for the Number of Monthly Medications, for AFDC Adults and Children

Months	Random Effects Results	
	San Mateo	Santa Barbara
AFDC Children? (patients = 16,716, obs = 376,820)		
1-12	-0.078**	-0.122**
13-24	-0.102**	-0.109**
25-36	-0.061**	-0.076**
37-48	-0.045**	-0.056**
49-60	-0.098**	-0.028*
61-72	0.03 1	0.004
73-84	----	0.007
85-96	----	0.097**
97-108	----	0.101**
109-120	----	0.054*
121-132	---	-0.003
AFDC Adults* (patients = 21,802, obs = 386,410)		
1-12	-0.022	-0.069**
13-24	-0.044**	-0.037
25-36	-0.150**	-0.064**
37-48	-0.061*	-0.054*
49-60	-0.144**	-0.075**
61-72	-0.255**	-0.055
73-84	---	-0.104**
85-96	mm--	0.083*
97-108	----	0.120**
109-120	----	0.085
121-132	----	0.091

Note: Estimated effects are relative to Ventura County.
† Multivariate results based on 12.5% random sub-sample of patients.
‡ Multivariate results based on 25% random sub-sample of patients.
* indicates statistically significant difference at the 0.01 level.
** indicates statistically significant difference at the 0.001 level.

Table 2-24: Percentage of Enrollee-Months with at Least One Surgery-Related Hospital Event and the Total Number of Hospital Days for Surgery-Related Hospital Events per Month Among Users Over Time, AF'DC Adults and Children

	AFDC Children			AFDC Adult		
	San Mateo	Santa Barbara	Ventura	San Mateo	Santa Barbara	Ventura
Percentage of Enrollee-Months with a Surgery-Related Hospital Event						
1987	0.1	0.1	0.1	0.2	0.3	0.4
1988	0.1	0.0	0.1	0.3	0.1	0.3
1989	0.1	0.1	0.1	0.3	0.4	0.3
1990	0.1	0.1	0.1	0.3	0.3	0.3
1991	0.1	0.1	0.1	0.4	0.4	0.3
1992	0.1	0.1	0.1	0.3	0.3	0.4
Mean Number of Hospital Days for Surgery-Related Hospital Events per Month						
1987	7.7	4.8	9.0	34.0‡	5.8	7.3
1988	9.3	4.9	6.2	6.7	6.7	5.5
1989	8.4	5.2	6.8	7.6	8.5	5.5
1990	6.6	6.1	7.0	7.6	6.7	5.8
1991	8.0	7.6	7.1	8.8	5.4	6.1
1992	6.6	9.4	7.6	16.4‡	7.0	5.8

‡ Mean is strongly affected by a pronounced outlier.

Table 2-25: Percentage of Enrollee-Months with at Least One Surgery-Related Hospital Event and the Total Number of Hospital Days for Medical-Related Hospital Events per Month Among Users Over Time, AF'DC Adults and Children

	AFDC Children			AFDC Adult		
	San Mateo	Santa Barbara	Ventura	Santa Mateo	Santa Barbara	Ventura
Percentage of Enrollee-Months with a Medical-Related Hospital Event						
1987	0.3	0.1	0.2	0.5	0.4	0.5
1988	0.2	0.1	0.2	0.5	0.2	0.4
1989	0.2	0.2	0.2	0.5	0.4	0.3
1990	0.2	0.2	0.2	0.5	0.4	0.3
1991	0.2	0.2	0.2	0.4	0.4	0.3
1992	0.2	0.2	0.2	0.5	0.6	0.3
Mean Number of Hospital Days for Medical-Related Hospital Events per Month						
1987,	8.5	3.4	3.9	3.6	5.7	4.6
1988	5.1	10.3	5.7	4.2	5.4	4.1
1989	4.1	6.5	5.4	5.0	5.5	5.3
1990	5.1	5.4	5.4	5.6	4.8	4.8
1991	5.7	4.3	5.5	6.3	4.8	4.7
1992	7.9	4.4	5.0	5.9	5.1	4.6

Table 2-26: Multivariate Regressions for the Number of Monthly Inpatient Hospital Admissions for Surgical and Medical Stays, AF'DC Adults and Children

	Random Effects Results	
Months	San Mateo	Santa Barbara
AF'DC Children† (patients = 16,716, obs = 376,820)		
1-12	-0.0016**	-0.0026**
13-24	0.0002**	-0.0006**
25-36	0.0012**	-0.0017**
37-48	0.0022**	-0.0006**
49-60	0.0026**	-0.0010**
61-72	0.0009**	0.0014**
73-84	- -	0.0009**
85-96	----	0.0018**
97-108	----	0.0013**
109-120	----	0.0026**
121-132	----	0.0056**
AFDC Adults‡ (patients = 21,802, obs = 386,410)		
1-12	0.0005**	-0.0002
13-24	0.0002	-0.0014**
25-36	-0.0009**	-0.0011**
37-48	-0.0013**	-0.0002
49-60	-0.0008**	0.0006**
61-72	0.0012*	0.0045**
73-84	- -	0.0035**
85-96	----	0.0049**
97-108	----	0.0066**
109-120	----	0.0078**
121-132	----	0.0005

Note: Estimated effects are relative to Ventura County.
† Multivariate results based on 12.5% random sub-sample of patients.
‡ Multivariate results based on 25% random sub-sample of patients.
* indicates statistically significant difference at the 0.01 level.
** indicates statistically significant difference at the 0.001 level.

With regard to delivery stays for AFDC women, the multivariate results indicate that length of stay was significantly shorter under managed care relative to FFS, particularly in more recent years (Table 2-29). On average, length of delivery stays were roughly 15 percent shorter in 1992 under managed care. The difference appears to suggest, coincident with the widely reported trends in the entire health care sector, that managed care in Medi-Cal was associated with shorter hospital delivery stays in the later years of our study.

Table 2-27: OLS Results for the (Log) Number of Monthly Hospital Days for Surgical/Medical Stays, AFDC Adults and Children

| | Length of Surgical/Medical Stay | |
	San Mateo	Santa Barb.
AFDC Children (n =8,265)		
1988	-0.057	0.134
1989	-0.018	0.064
1990	-0.045	0.033
1991	0.016	-0.119
1992	0.001	-0.073
AFDC Adults (n = 10,082)		
1988	0.069	**0.070**
1989	0.090	0.055
1990	0.016	0.020
1991	0.087	-0.008
1992	0.107	0.043

Note: Estimated effects are relative to Ventura County; omitted year in interaction effects is 1987.
* indicates statistically significant difference at the 0.01 level.
** indicates statistically significant difference at the 0.001 level.

Table 2-28: Percentage of Enrollee-Months with at Least One Delivery-Related Hospital Event and the Total Number of Hospital Days for Delivery-Related Hospital Events per Month Among Users Over Time, AFDC Enrollees

	San Mateo	Santa Barbara	Ventura
Percentage of Enrollee-Months with a Delivery-Related Hospital Event			
1987	1.4	1.3	2.5
1988	1.6	0.5	2.5
1989	1.5	1.9	2.3
1990	1.5	1.6	2.3
1991	1.4	1.4	2.2
1992	1.3	1.1	2.4
Mean Number of Hospital Days for Delivery-Related Hospital Events per Month			
1987	4.1	3.0	16.2‡
1988	3.9	3.5	3.2
1989	3.5	2.7	2.9
1990	3.1	3.6	3.1
1991	3.0	2.6	3.1
1992	3.1	2.4	3.8

‡ Mean is strongly affected by a pronounced outlier.

Table 2-29: OLS Results for the (Log) Number of Monthly Hospital Days for Delivery Stays. AFDC Enrollees

	Delivery Stays	
	San Mateo	Santa Barbara
AFDC Enrollees (n=25,783)		
1988	0.186**	0.099
1989	0.056	-0.089**
1990	-0.07 1*	-0.056
1991	-0.046	-0.129**
1992	-0.140**	-0.153**

Note: Estimated effects are relative to Ventura County; omitted year in interaction effects is 1987.
* indicates statistically significant difference at the 0.01 level.
** indicates statistically significant difference at the 0.001 level.

5.1.4 Medi-Cal Expenditures

Real Medi-Cal monthly per-person spending for AFDC enrollees was consistently lower in the managed care counties relative to Ventura (Table 2-30). The multivariate results presented in Table 2-31 suggest that for AFDC adults managed care is associated with a statistically significant 30 to 50 percent reduction in monthly expenditures during the first year of enrollment; for children the percentage difference in expenditures in the first year of enrollment was 25 to 30

Table 2-30: Mean Monthly Medicaid Spending Among AR Enrollees and Among Users of Services Over Time, AFDC Adults and Children

	AFDC Children			AFDC Adults		
	San Mateo	Santa Barbara	Ventura	San Mateo	Santa Barbara	Ventura
Mean Real Monthly Medicaid Spending Among All Enrollees						
1987	25.58	10.35	20.95	66.65	48.23	109.59
1988	17.71	6.82†	23.00	67.60	22.24†	86.04
1989	13.48	16.99	22.59	62.76	68.67	79.24
1990	13.88	15.96	20.44	57.40	64.04	76.07
1991	16.40	15.04	21.07	58.96	53.53	75.30
1992	13.96	14.66	26.32	58.38	51.22	81.08
Mean Real Monthly Medicaid Spending Among Users of Services						
1987	158.37	74.59	85.93	270.88	197.29	279.20
1988	103.30	145.03	92.38	225.76	234.21	218.88
1989	86.01	86.18	86.97	205.5 1	201.28	208.89
1990	87.93	81.34	82.97	185.41	188.71	203.23
1991	97.77	73.16	86.59	189.35	159.51	208.26
1992	78.43	69.3 1	96.3 1	177.77	146.84	201.20

† The discrepancy is likely due to reporting anomalies during the year.

percent.[5] The expenditure differences, however, appeared to diminish as enrollment duration increased; in Santa Barbara adults and children enrolled for longer than seven years tended to be more expensive than their FFS counterparts. The expenditure differences for AFDC children ranged between 15 and 30 percent saving under managed care over time. While a. portion of the spending differences may be due to carved out services and under-reporting, it is doubtful that the full amount is attributable to such discrepancies. In general the results suggest that managed care savings may be substantial within the AFDC population.

Table 2-31: Multivariate Regressions for (Log) Monthly Real Medicaid Spending, AFDC Adults and Children

Month	Random Effects Results	
	San Mateo	Santa Barbara
AFDC Children? (patients = 16,716, obs = 376,820)		
1-12	-0.286**	-0.374**
13-24	-0.280**	-0.298**
25-36	-0.193**	-0.225**
37-48	-0.161**	-0.163**
49-60	-0.135**	-0.057
61-72	-0.100	0.042
73-84	- -	0.069
85-96	----	0.25 1 **
97-108	----	0.293* *
109-120	----	0.298**
121-132	----	0.207
AFDC Adults‡ (patients = 21,802, obs = 386,410)		
1-12	-0.393**	-0.663**
13-24	-0.378**	-0.546**
25-36	-0.497**	-0.438**
37-48	-0.349**	-0.365**
49-60	-0.377**	-0.324**
61-72	-0.509	-0.217**
73-84	- -	-0.165
85-96	----	0.315**
97-108	----	0.449**
109-120	----	0.342**
121-132	----	0.319

Note: Estimated effects are relative to Ventura County.
† Multivariate results based on 12.5% random sub-sample of patients.
‡ Multivariate results based on 25% random sub-sample of patients.
* indicates statistically significant difference at the 0.01 level.
** indicates statistically significant difference at the 0.001 level.

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[5] The percentage change associated with managed care enrollment can be calculated with the formula $e^{\beta}-1$, where β is the estimated coefficient and e is approximately 2.71828.

5.1.5 AFDC Summary

The results regarding MMC for the AFDC population presented a mixed picture of managed care effects. We consider the results to our four primary research questions in turn. Regarding access to care, we observed generally lower levels of all types of ambulatory care in the managed care counties throughout the period of study. **The** ambulatory care results are inconsistent with our expectation that managed care would increase levels of ambulatory care, and are suggestive of possibly reduced access to care. However, we observed that ER visits were lower in the managed care counties, which was consistent with our hypothesis that managed care would be associated with decreased levels of emergency care. Another dimension of access to care that we considered was hospitalizations for **ACSCs.** The lower level of ambulatory care overall under managed care might presage the findings regarding ACSC hospitalizations, which appeared to occur at a somewhat higher rate among managed care enrollees.

We also presented results for utilization of preventive care services by **AFDC** enrollees. The results pointed to inadequate preventive care and immunizations for children in all three counties. Santa Barbara enrollees had the highest rates of compliance, but Ventura, interestingly, showed the most dramatic improvement over time. The preventive care results are more troubling given that our analysis was restricted to the continuously enrolled, who are likely to be **among** the easiest to affect.

Our results suggested that ambulatory visits with laboratory and radiology procedures and medications were significantly lower under managed care. The results, while consistent with a picture of managed care reducing unnecessary or marginally useful services, could also indicate reduced access to care. Surprisingly, managed care enrollees appeared to exhibit a higher level of inpatient admissions. The result is contrary to previous research and could indicate the consequences of the lower levels of ambulatory care among managed care enrollees. Further, while overall length of hospital stay did not differ significantly between managed care and FFS, delivery-related hospitalizations were significantly shorter among managed care enrollees in 1991 and 1992.

We found that expenditures were significantly lower for AFDC adults and children through the majority of the enrollment duration distribution. A separate and more difficult question concerns whether the cost savings come at the expense of quality of care. In general for AFDC adults and children, we have observed significantly lower levels of ambulatory care under managed care, including ER care (though the ER results did not persist over time), lower levels of laboratory and radiology services, lower levels of medications, no discernable trends in preventive care over time in the managed care counties, a slightly higher rate of inpatient hospital admissions for surgical and medical reasons, and shorter delivery stays in the hospital. It is generally not a picture consistent with increased quality and access, but beyond saving money conclusions are difficult to draw.

5.2 SSI Enrollees

Persons eligible for Medicaid through the SSI program typically have a higher standard of medical need, as they are disabled or older. SSI enrollees are fewer in number than other

eligibility categories, but far more costly on average. In general, the disabled may benefit greatly from more intensive management; because of the higher level of need, SSI enrollees may benefit from a care environment with greater continuity and a primary care provider who is familiar with their needs. At the same time, managed care brings greater risks if patients are under-served or are denied access to specialists.

52.1 Access **to Care**

As mentioned in Section 3, we investigate the differences in the use of ambulatory care, by examining the incidence and quantity of monthly ambulatory visits and the differences in setting of ambulatory care over time in the three counties. Next, we examine the incidence and extent of ER care. Finally, we examine differences in ambulatory care sensitive hospitalizations.

Total Ambulatory Care. Table 2-32 displays descriptive statistics for the incidence and quantity of ambulatory days of care for SSI enrollees per month. In general, SSI enrollees, consistent with their higher level of need, used more services in comparison to AFDC enrollees. **If enrollees** had any ambulatory visits within a month, they averaged roughly two visits during the month. Tables 2-33 and 2-34 reveal a striking pattern of ambulatory care use among SSI enrollees. In the first 12 months of enrollment, adult SSI enrollees in managed care received more frequent and more intensive care in San Mateo relative to Ventura, while in Santa Barbara there was no significant difference from the FFS level in the first 12 months of enrollment. However, over subsequent years of enrollment adult SSI enrollees in San Mateo appeared to receive similar levels of ambulatory care relative to Ventura, while Santa Barbara enrollees appeared to receive lower levels of ambulatory care. The results are consistent with a pattern of heavier initial treatment of managed care enrollees relative to FFS enrollees, with managed care reaping the rewards of the initial treatment in subsequent years.

A similar pattern for SSI children is suggested in Tables 2-33 and 2-34: children in San Mateo received similar levels of ambulatory care in the first 12 months of enrollment, but in subsequent years ambulatory care was significantly reduced. In Santa Barbara, the pattern is less clear as few coefficients show significant differences between Santa Barbara and Ventura County enrollees.

Setting of Care. Table 2-35 shows distinctly different care settings for **SSI** enrollees across the three counties. Few SSI enrollees in San Mateo received care in an office setting, and the proportion appeared relatively stable over time; most received care in outpatient departments and clinics. Conversely, a large proportion of Santa Barbara patients received services at an office setting, but the proportion dropped over time. Ventura County also appeared to have a relatively low proportion of care rendered in doctors' offices, and the proportion fell over time. Surprisingly, San Mateo and Santa Barbara both had increases in the proportion o:f care occurring at the ER.

Table 2-32: Percentage of Enrollee-Months with at Least One Ambulatory Care Day and Number of Ambulatory Care Days per Month Among Users Over Time for SSI Adults and Children

	SSI Children			SSI Adults (n = 310,520)		
	San Mateo	Santa Barbara	Ventura	San Mateo	Santa Barbara	Ventura
Percentage of Enrollee-Months with Ambulatory Care						
1987	26.2	31.7	40.3	35.0	27.4	32.4
1988	29.8	14.1†	39.9	36.6	13.5†	31.3
1989	28.1	43.0	36.7	35.5	30.7	35.6
1990	6.6†	41.2	3.4†	12.2†	27.0	2.9†
1991	30.0	35.5	38.5	35.8	24.8	34.9
1992	29.8	34.3	44.2	36.8	23.9	39.1
Mean Number of Ambulatory Care Days per Month Among Enrollees with Events						
1987	1.96	1.82	1.97	2.35	1.82	2.20
1988	1.85	1.67	1.92	2.37	1.75	2.20
1989	1.72	2.06	2.10	2.24	2.13	2.15
1990	1.53	2.06	2.23	2.21	2.07	2.12
1991	1.95	1.92	2.10	2.35	2.17	2.18
1992	1.89	1.95	2.23	2.50	2.09	2.72

† The discrepancy is likely due to reporting anomalies during the year.

Table 2-33: Multivariate Results for the Occurrence of a Monthly Ambulatory Medical Event, SSI Adults and Children

	Random Effects Probit Results	
Month	Sub-Matched §	Sub-Random §
SSI Children (patients = 1785, obs = 58,731)		
1-12	0.059**	0.078**
13-24	-0.119**	-0.03 1
25-36	-0.222**	-0.059**
37-48	-0.154**	-0.003
49-60	-0.123**	0.010
61-72	-0.155	0.071**
73-84	----	-0.004
85-96	- -	0.189**
97-108	- -	0.521**
109-120	----	0.055
121-132	----	0.085**
SSI Adults‡ (patients = 7,440, obs = 237,837)		
1-12	0.074**	0.017**
13-24	-0.009	-0.033**
25-36	-0.043**	-0.072**
37-48	0 . 0 0 6	-0.077**
49-60	-0.025**	-0.099**
61-72	-0.052*	-0.134**
73-84	- -	-0.218**
85-96	----	-0.058**
97-108	- -	0.292**
109-120		-0.141**
121-132	----	-0.152**

Note: Estimated effects are relative to Ventura County.

§ Results displayed are marginal (probability) effects based on mean values of regressors.

‡ Multivariate results based on 25% random sub-sample of patients.

* indicates statistically significant difference at the 0.01 level.

** indicates statistically significant difference at the 0.001 level.

Table 2-34: Multivariate Results for the Number of Monthly Ambulatory Medical Events, SSI Adults and Children

Months	Random Effects Results	
	San Mateo	Santa Barbara
SSI Children (patients = 1785, obs = 58,731)		
1-12	-0.016	-0.033
13-24	-0.291**	-0.118
25-36	-0.514**	-0.180**
37-48	-0.399**	-0.058
49-60	-0.466**	-0.098
61-72	-0.449**	0.079
73-84	----	0.02 1
85-96	----	0.336**
97-108	----	0.847**
109-120	----	0.126
121-132	----	0.170
SSI Adults‡ (patients = 7,440, obs = 237,837)		
1-12	0.222**	-0.011
13-24	0.011	-0.130*
25-36	-0.034	-0.224**
37-48	0.080	-0.252**
49-60	-0.06 1	-0.344**
61-72	-0.178	-0.474**
73-84	- -	-0.577**
85-96	----	-0.315**
97-108	----	0.169*
109-120	----	-0.525**
121-132	----	-0.711**

Note: Estimated effects are relative to Ventura County.
‡ Multivariate results based on 25% random sub-sample of patients.
* indicates statistically significant difference at the 0.01 level.
** indicates statistically significant difference at the 0.001 level.

ER care among SSI enrollees was relatively rare in all three counties (Table 2-36), though multivariate analyses suggest that San Mateo County had comparatively higher levels of ER visits (Table 2-37). By contrast, Santa Barbara enrollees had significantly lower levels of ER visits during the first three years of enrollment. In the eighth year, ER visits appeared to rise, but the results may be an artifact of small number of people enrolled for such a lengthy period. A similar pattern was apparent for SSI children in Santa Barbara County. The finding in San Mateo of higher ER use is contrary to the results for AFDC enrollees, as well as our expectations, and could indicate inadequate care of chronically ill populations. Though the estimated differences in ER use between the managed care counties and the FFS county is relatively small--between one-tenth and one-quarter of a visit per member per year for adults in San Mateo-they are statistically significant.

Table 2-35: Percentage Distribution of Monthly Ambulatory Care Days by Setting of Care. Over Time for SSI Adults and Children

	Office	Outpatient Department	Emergency Room	Other Ambulatory
San Mateo				
1987	40.7	23.5	7.8	28.0
1988	40.5	21.4	8.2	29.9
1989	40.0	21.2	9.1	29.0
1990	35.0	24.8	9.8	27.9
1991	37.0	24.8	9.6	28.0
1992	40.9	24.9	9.8	23.5
Santa Barbara				
1987	73.5	6.9	7.6	12.0
1988	60.4	11.1	9.9	18.6
1989	71.8	6.3	6.5	15.4
1990	63.6	8.3	8.6	19.4
1991	62.8	8.3	9.4	19.5
1992	64.3	9.3	11.1	15.3
Ventura				
1987	50.2	24.6	6.6	18.5
1988	49.6	25.6	6.0	18.7
1989	41.1	21.6	5.0	17.3
1990	53.0	23.6	4.9	11.4
1991	41.1	21.5	5.2	12.0
1992	36.5	20.9	4.9	11.1

Table 2-36: Percentage of Enrollee-Months with at Least One Emergency Room Visit and Number of Emergency Room Visits per Month Among Users Over Time, SSI Adults and Children

	SSI Children			SSI Adults		
	San Mateo	Santa Barbara	Ventura	San Mateo	Santa Barbara	Ventura
Percentage of Enrollee-Months with an ER Visit						
1987	3.7	2.8	3.5	4.5	3.1	3.3
1988	4.1	0.9†	3.2	4.8	1.8	3.0
1989	4.5	2.9	3.3	5.0	3.3	2.9
1990	0.6†	3.2	0.3†	1.9	3.5	0.2
1991	5.1	3.4	4.1	5.5	3.3	3.0
1992	5.3	3.1	4.2	5.8	3.8	3.4
Mean Number of ER Visits per Month Among Enrollees with Events						
1987	1.71	1.07	1.34	1.43	1.23	1.62
1988	1.08	1.04	1.28	1.36	1.15	1.51
1989	1.26	1.07	1.27	1.34	1.23	1.47
1990	1.31	1.19	1.00	1.34	1.24	1.43
1991	1.26	1.17	1.28	1.34	1.23	1.47
1992	1.27	1.17	1.32	1.40	1.32	1.44

† The discrepancy is likely due to reporting anomalies during the year.

Table 2-37: Multivariate Regression Results for the Number of Emergency Room Visits per Month Among Users Over Time, SSI Adults and Children

Month	Random Effects Results	
	San Mateo	Santa Barbara
SSI Children (patients = 1785, obs = 58,731)		
1-12	0.005*	0.0003
13-24	0.013**	-0.013**
25-36	0.002	-0.013**
37-48	-0.0006	-0.009**
49-60	0.010**	-0.009**
61-72	0.011	0.013**
73-84	----	0.002
85-96	----	0.009**
97-108	----	0.026**
109-120	----	0.015**
121-132	----	0.029**
SSI Adults‡ (patients = 7,440, obs = 237,837)		
1-12	0.009**	-0.006**
13-24	0.008**	-0.009**
25-36	0.014**	-0.008**
37-48	0.021**	0.002
49-60	0.022**	-0.0003
61-72	0.024**	-0.0002
73-84	- -	-0.003
85-96	----	0.008**
97-108	- -	0.036**
109-120	- -	-0.002
121-132	---	0.024**

Note: Estimated effects are relative to Ventura County.
‡ Multivariate results based on 25% random sub-sample of patients.
* indicates statistically significant difference at the 0.01 level.
** indicates statistically significant difference at the 0.001 level.

Hospital Stays for Ambulatory Care Sensitive Conditions. ACSC hospitalization rates were roughly similar among SSI enrollees in the three counties (Table 2-38). The results for children were somewhat variable because of the relatively small sample of SSI children. In general the descriptive results display the same approximate proportion of inpatient stays for ACSC's as seen in the AFDC population. Multivariate results presented in Table 2-39 show that there were no significant differences in the rate of ACSC hospitalizations between managed care enrollees and FFS enrollees.

Table 2-38: Percentage of Enrollee-Months with at Least One Hospitalization for ACSC and Percent of Non-Delivery-Related Hospitalizations for ACSCs per Month Over Time, for SSI Adults and Children

	SSI Children			SSI Adults		
	San Mateo	Santa Barbara	Ventura	San Mateo	Santa Barbara	Ventura
Percentage of Enrollee-Months with a Hospitalization for ACSC						
1987	2.1	0.3	0.3	0.6	0.5	0.2
1988	0.7	0.2	0.2	0.7	0.3	0.2
1989	0.4	0.4	0.6	0.7	0.7	0.2
1990	0.0	0.1	0.3	0.3	0.6	0.2
1991	0.8	0.2	0.6	0.7	0.6	0.2
1992	0.6	0.2	0.5	0.7	0.6	0.2
Percentage of Non-Delivery-Related Hospitalizations for ACSCs						
1987	80.0	32.0	25.9	22.7	28.2	30.5
1988	31.3	33.3	23.8	22.8	26.8	29.7
1989	21.6	29.5	45.7	28.8	33.4	22.0
1990	0.0	13.8	18.6	29.0	29.8	21.1
1991	35.2	20.8	49.1	31.0	30.8	28.3
1992	36.2	30.4	35.2	30.7	34.3	28.8

5.2.2 Preventive Care

Well-child visits and childhood immunizations were not observed for SSI-eligible children. The reasons for their absence is not clear, though it could be that such services were performed in conjunction with other services during ambulatory visits and were not recorded in the primary procedural field on the claim report. It is possible that newborn children eligible for SSI have special needs that would likely take precedence in the claims reporting.

Pap smear codes were observed among the SSI population. Results of compliance with annual pap smear recommendations for SSI adults are compiled in Table 2-40. The results suffer from small cell sizes, but generally reveal extremely low rates of compliance with annual pap smears for SSI women. Multivariate results for pap smear compliance in Table 2-41 support the bivariate findings, but are not statistically significant. Note that due to low cell sizes multivariate models for 24 month compliance failed to converge.

Table 2-39: Multivariate Results for the Occurrence of a Monthly ACSC Hospitalization, SSI Adults and Children

Months	Random Effects Probit Results	
	San Mateo	Santa Barbara
SSI Children (patients = 1785, obs = 58,731)		
1-12	0.00008	0.00003
13-24	-0.00003	-0.00005
25-36	-0.00006	0.00001
37-48	0.00004	-0.00009
49-60	0.00005	0.00002
61-72	-0.00054	0.00005
73-84	----	-0.00008
85-96	----	-0.00006
97-108	----	-0.00054
109-120	----	0.00008
121-132	----	0.00001
SSI Adults‡ (patients = 7,440, obs = 237,837)		
1-12	0.0002	-0.0001
13-24	0.0001	-0.0001
25-36	0.0001	0.0000
37-48	0.0003	0.0003
49-60	0.0004	0.0006
61-72	-0.0026	0.0000
73-84	- -	0.0004
85-96	- -	0.0001
97-108	- -	0.0005
109-120	- -	0.0003
121-132	----	0.0001

Note: Estimated effects are relative to Ventura County.

§ Results displayed are marginal (probability) effects based on mean values of regressors.

‡ Multivariate results based on 25% random sub-sample of patients.

* indicates statistically significant difference at the 0.01 level.

** indicates statistically significant difference at the 0.001 level.

Table 2-40: Percentage of Continuously Enrolled Women Aged 18-39 Years with a Pap Smear by Time Enrolled and Year, SSI Adults

	Santa Barbara			San Mateo			Ventura		
	N	% No Pap Smears	% Full Compliance	N	% No Pap Smears	% Full Compliance	N	% No Pap Smears	% Full Compliance
At 12 Months of Eligibility[1]									
1987	399	90.7	9.3	548	88.5	11.5	822	90.6	9.4
1988	38	79.0	21.0	80	87.5	12.5	102	98.0	2.0
1989	49	87.8	12.2	84	91.7	8.3	127	94.5	5.5
1990	42	90.5	9.5	79	92.4	7.6	94	97.9	2.1
1991	54	92.6	7.4	97	87.6	12.4	115	85.2	14.8
1992	15	93.3	6.7	20	90.0	10.0	48	89.6	10.4
All years	597	89.9	10.1	908	89.0	11.0	1308	91.6	8.4
At 24 Months of Eligibility[2]									
1987	355	86.2	1.7	502	81.1	5.6	773	83.2	4.0
1988	31	67.7	6.5	70	80.0	2.8	88	8.3.9	1.2
1989	43	76.7	2.3	74	83.8	1.4	110	89.5	0.0
1990	39	92.3	0.0	66	80.3	4.5	74	8'7.8	1.4
1991	15	93.3	6.7	18	72.2	0.0	38	81.1	5.4
All years	483	84.9	2.1	730	81.0	4.7	1048	84.2	3.2

[1] Full compliance is 1 pap smear.
[2] Full compliance is 2 pap smears.

Table 2-41: Marginal Odds Ratios for the Probability of Pap Smear Compliance, Continuously Enrolled SSI Women Aged 18-39 Years

	12 Month Pap Smear Compliance	
	San Mateo	Santa Barbara
1987	1.281	0.953
1988	7.880*	9.963*
1989	1.279	2.425
1990	3.046	7.028
1991	0.727	0.412
1992	0.818	0.569

[*] indicates statistically significant difference at the 0.01 level.
[**] indicates statistically significant difference at the 0.001 level.

5.2.3 Patterns of Health Service Use

Laboratory and Radiology Services. Similar to the results observed for ambulatory care days, multivariate results for the number of ambulatory care days with laboratory and radiology services suggest that recently enrolled SSI adults and children in San Mateo had levels of utilization that did not significantly differ from **FFS** enrollees (Table 2-43). However, SSI adults and children enrolled in managed care longer than a year had significantly lower levels of laboratory and radiology services relative to their FFS counterparts. SSI enrollees in Santa Barbara had generally lower levels of laboratory and radiology services over time, but the result may be due to reporting anomalies seen in the descriptive statistics. The results,, particularly in San Mateo, seem consistent with a pattern of equivalent care under MMC for newly enrolled SSI enrollees, but lower levels in subsequent years.

Table 2-42: Percentage of Enrollee-Months with at Least One Ambulatory Care Day with Laboratory and Radiology Services and the Number of Ambulatory Care Days with Laboratory and Radiology Services per Month Among Users Over Time. for SSI Adults and Children

	SSI Children			SSI Adults		
	San Mateo	Santa Barbara	Ventura	San Mateo	Santa Barbara	Ventura
Percentage of Enrollee-Months with Ambulatory Laboratory/Radiology Services						
1987	10.5	0.1†	13.8	11.7	0.6†	13.5
1988	11.4	0.1†	14.4	13.5	1.3†	13.1
1989	10.9	0.6†	15.9	14.4	4.6†	12.5
1990	1.5†	4.4†	2.0†	5.2†	5.0†	1.2†
1991	12.6	12.0	15.4	15.5	10.2	12.3
1992	11.0	11.3	19.1	15.8	10.0	14.3
Mean Number of Ambulatory Care Days with Laboratory/Radiology Services						
1987	1.75	1.00	1.47	1.61	1.50	1.56
1988	1.27	1.00	1.39	1.58	1.33	1.59
1989	1.27	1.11	1.48	1.53	1.43	1.62
1990	1.23	1.22	1.41	1.67	1.36	1.81
1991	1.37	1.30	1.50	1.63	1.53	1.64
1992	1.39	1.49	1.57	1.70	1.56	1.78

† The discrepancy is likely due to reporting anomalies during the year.

Table 2-43: Multivariate Regression Results for the Number of Monthly Outpatient Visits with Laboratory and Radiology Services, for SSI Adults and Children

	Random Effects Results	
Months	San Mateo	Santa Barbara
SSI Children (patients = 1785, obs = 58,731)		
1-12	-0.022	-0.128**
13-24	-0.083**	-0.185**
25-36	-0.185**	-0.218**
37-48	-0.166**	-0.162**
49-60	-0.201**	-0.122**
61-72	-0.205**	-0.075**
73-84	m-m-	-0.042**
85-96	___	-0.073**
97-108	----	0.099**
109-120		0.062**
121-132	___	0.056**
SSI Adults‡ (patients = 7,440, obs = 237,837)		
1-12	-0.015	-0.139**
13-24	-0.025 *	-0.123**
25-36	-0.025*	-0.129**
37-48	0.024	-0.100**
49-60	0.002	-0.115**
61-72	-0.017	-0.131**
73-84	- -	-0.113**
85-96	---	-0.081**
97-108	----	0.032*
109-120		-0.015
121-132	----	-0.038*

Note: Estimated effects are relative to Ventura County.

‡ Multivariate results based on 25% random sub-sample of patients.

* indicates statistically significant difference at the 0.01 level.

** indicates statistically significant difference at the 0.001 level.

Medications. As observed in the AFDC sample, San Mateo SSI enrollees were less likely to have had any medication use, but had higher quantities of medications when they did relative to Santa Barbara and Ventura County beneficiaries (2-44). Multivariate results presented in Table 2-45 show that San Mateo enrollees had a significantly higher level of medication use in the first year of enrollment, but no significant differences in subsequent years; relative to Ventura enrollees; San Mateo children showed no significant differences in medication use from Ventura enrollees. The multivariate results indicate that Santa Barbara SSI adults and children had markedly higher rates of pharmaceutical utilization relative to Ventura and San Mateo, but only among children enrolled longer than three years. For adults in Santa Barbara, the significantly higher rates of medication use did not appear until after seven years of enrollment. The utilization difference between Santa Barbara and Ventura ranged from 4.5 to 9 more medications per year for long-term enrolled SSI children and 6.5 and 7.5 medications per year for long-term enrolled SSI adults, however, the source of the differences is unclear.

Table 2-44: Percentage of Enrollee-Months with at Least One Medication and the Number of Medications per Month Among Users Over Time. for SSI Adults and Children

	SSI Children			SSI Adults		
	San Mateo	Santa Barbara	Ventura	San Mateo	Santa Barbara	Ventura
Percentage of Enrollee-Months with a Medication						
1987	**23.6**	**28.6**	**25.6**	**40.4**	**37.9**	**43.5**
1988	**26.1**	11.0†	26.1	42.2	10.4†	43.8
1989	23.2	38.9	24.6	39.6	49.4	42.6
1990	21.9	38.0	25.0	37.4	50.1	41.7
1991	22.7	37.7	25.3	36.6	50.5	42.2
1992	25.3	39.7	28.2	38.3	51.5	44.9
Mean Number of Medications per Month						
1987	3.13	2.00	2.25	3.92	2.97	3.20
1988	2.74	2.38	2.15	3.54	2.64	3.15
1989	2.73	2.42	2.29	3.59	3.29	3.17
1990	2.69	2.45	2.37	3.90	3.37	3.28
1991	3.66	2.40	2.45	4.05	3.44	3.38
1992	3.64	2.78	2.46	4.29	3.59	3.51

† The discrepancy is likely due to reporting anomalies during the year.

Hospital Stays. As noted with the AFDC results, patterns in the descriptive data on length of stay are difficult to discern given the rarity of admissions and the impact of length of stay outliers (Tables 2-46 and 2-47). However, multivariate results for the number of inpatient admissions again show the curious result observed in the AFDC population: a significantly increased rate of admissions in the managed care counties for both adults and children (Table 2-48). The increase is more sporadic among San Mateo SSI children and Santa Barbara enrollees, but it is clearly evident for SSI adults in San Mateo.

Table 2-45: Multivariate Results for the Number of Monthly Medications, SSI Adult and Children

	Random Effects Results	
Months	San Mateo	Santa Barbara
SSI Children (patients = 1785, obs = 58,731)		
1-12	0.153	0.062
13-24	-0.084	0.059
25-36	-0.238	0.056
37-48	0.147	0.367**
49-60	0.251	0.454**
61-72	-0.049	0.479**
73-84	- -	0.535**
85-96	----	0.740**
97-108	----	0.793**
109-120	- -	0.710**
121-132	----	0.766**
SSI Adults‡ (patients = 7,440, obs = 237,837)		
1-12	0.317**	-0.119
13-24	-0.185	-0.275
25-36	-0.235	-0.170
37-48	-0.232	-0.091
49-60	-0.319*	0.035
61-72	-0.208	0.099
73-84	- -	-0.358*
85-96	- -	0.609**
97-108	- -	0.633**
109-120	----	0.559**
121-132	- -	0.347

Note: Estimated effects are relative to Ventura County.
‡ Multivariate results based on 25% random sub-sample of patients.
* indicates statistically significant difference at the 0.01 level.
** indicates statistically significant difference at the 0.001 level.

After taking the natural logarithm of length of stay, Table **2-49** indicates that SSI adults in Santa Barbara had significantly shorter lengths of stay for surgery- and medical-related hospitalizations relative to Ventura. Results for San Mateo showed no consistent year-by-year trends, but might be adversely affected by outliers.

The result for delivery-related hospitalizations, presented in Tables **2-50** and 2-5 1, are relatively uninformative given the scarcity of cases.

Table 2-46: Percentage of Enrollee-Months with at Least One Surgery-Related Hospital Event and the Total Number of Hospital Days for Surgery-Related Hospital Events per Month Among Users Over Time, SSI Adults and Children

	SSI Children			SSI Adults		
	San Mateo	Santa Barbara	Ventura	San Mateo	Santa Barbara	Ventura
Percentage of Enrollee-Months with a Surgery-Related Hospital Event						
1987	0.0	0.2	0.6	1.1	0.3	0.4
1988	0.4	0.2	0.4	0.9	0.2	0.3
1989	0.5	0.3	0.7	0.9	0.3	0.4
1990	0.0	0.3	0.6	0.4	0.5	0.3
1991	1.1	0.3	0.5	0.9	0.5	0.4
1992	0.5	0.2	0.5	0.8	0.4	0.6
Mean Number of Hospital Days for Surgery-Related Hospital Events per Month						
1987	0.0	5.6	7.4	22.9	12.1	11.0
1988	4.4	6.2	4.8	14.5	15.6	11.2
1989	6.6	4.8	20.1‡	13.8	15.1	13.3
1990	2.0	8.5	12.4	16.0	15.0	10.8
1991	6.4	5.3	8.9	12.8	15.6	11.5
1992	32.0‡	28.6‡	7.1	25.3	13.2	10.7

‡ Mean is strongly affected by pronounced outliers.

Table 2-47: Percentage of Enrollee-Months with at Least One Medical-Related Hospital Event and the Total Number of Hospital Days for Medical-Related Hospital Events per Month Among Users Over Time, SSI Adults and Children

	SSI Children			SSI Adults		
	San Mateo	Santa Barbara	Ventura	San Mateo	Santa Barbara	Ventura
Percentage of Enrollee-Months with a Medical-Related Hospital Event						
1987	2.6	0.8	0.7	2.4	1.4	0.9
1988	1.9	0.4	0.6	2.5	0.9	0.8
1989	1.3	1.2	0.8	2.0	1.8	1.1
1990	0.0	0.6	0.9	0.8	1.6	1.2
1991	1.1	0.5	0.7	1.8	1.3	1.0
1992	1.1	0.5	0.8	1.9	1.3	1.0
Mean Number of Hospital Days for Medical-Related Hospital Events per Month						
1987	9.0	7.8	6.8	10.3	9.4	9.2
1988	4.6	18.3‡	4.7	10.9	10.3	8.3
1989	3.1	5.5	5.2	9.1	7.6	11.2
1990	12.0	6.6	6.3	9.4	8.7	10.8
1991	7.9	2.9	5.8	8.3	7.0	10.2
1992	10.0	2.3	5.1	19.6‡	9.0	8.2

‡ Mean is strongly affected by pronounced outliers.

Table 2-48: Multivariate Results for the Number of Monthly Inpatient Hospital Admissions for Surgical/Medical Stays, SSI Adults and Children

| Month | Random Effects Results | |
	San Mateo	Santa Barbara
SSI Children (patients = 1785, obs = 58,731)		
1-12	0.005**	0.0001
13-24	0.0005	0.0012*
25-36	-0.010**	0.003**
37-48	0.005**	-0.0003
49-60	0.002**	-0.002**
61-72	0.023**	0.005**
73-84	----	-0.003**
85-96	---	0.003**
97-108	----	-0.000
109-120		0.006**
121-132	- -	0.001
SSI Adults* (patients = 7,440, obs = 237,837)		
1-12	0.009**	0.002**
13-24	0.002**	-0.003**
25-36	0.002**	0.0003
37-48	0.007**	0.005**
49-60	0.009**	0.007**
61-72	0.001	-0.003**
73-84	- -	-0.002**
85-96	----	-0.002**
97-108	----	-0.001
109-120		-0.002**
121-132	----	-0.001

Note: Estimated effects are relative to Ventura County.
‡ Multivariate results based on 25% random sub-sample of patients.
* indicates statistically significant difference at the 0.01 level.
** indicates statistically significant difference at the 0.001 level.

5.2.4 Medi-Cal Expenditures

Consistent with our expectations, average per&member per-month Medi-Cal spending on SSI adults and children was generally higher than the spending levels observed in the AFDC population. Table 2-52 shows that in a typical month each SSI child in San Mateo and Ventura had roughly $100 in Medicaid spending, while SSI adults averaged roughly $110 to $140 per member per month. Spending in Santa Barbara was consistently higher than in San Mateo and Ventura counties as the typical SSI child enrollee accounted for roughly $200 per month, and the typical SSI adult enrollee accounted for between $150 and $180 per month. However, multivariate results in Table 2-53 show a pattern similar to that seen in many utilization measures: newly enrolled SSI adults and children exhibited spending levels similar to newly enrolled FFS enrollees, but in subsequent years spending levels for managed care enrollees fell

below their FFS counterparts. The effect indicates that cost savings may take time to illicit from disabled populations, but they do come.

Table 2-49: OLS Results for the (Log) Number of Monthly Hospital Days for Surgical/Medical Stays, SSI Enrollees

| | Length of Surgical/Medical Stay | |
	San Mateo	Santa Barbara
SSI Children (n = 658)		
1988	**-0.227**	**0.445**
1989	**-0.705****	**-0.465**
1990	-0.104	**-0.206**
1991	**0.206**	**-0.092**
1992	0.329	-0.059
SSI **Adults (n = 34,721)**		
1988	**0.370****	**0.086**
1989	**-0.006**	-0.147**
1990	0.015	-0.108*
1991	-0.054	-0.145**
1992	**0.350****	-0.100*

Note: Estimated effects are relative to Ventura County; omitted year in interaction effects is 1987.
* indicates statistically significant difference at the 0.01 level.
** indicates statistically significant difference at the 0.001 level.

Table 2-50: Percentage of Enrollee-Months with at Least One Delivery-Related Hospital Event and the Total Number of Hospital Days for Delivery-Related Hospital Events per Month Among Users Over Time, SSI Enrollees

	San Mateo	Santa Barbara	Ventura
Percentage of Enrollee-Months with a Delivery-Related Hospital Event			
1987	0.07	0.06	0.07
1988	0.04	0.02	0.03
1989	0.05	0.03	0.04
1990	0.03	0.05	0.05
1991	0.06	0.06	0.03
1992	0.05	0.03	0.03
Mean Number of Hospital Days for Delivery-Related Hospital Events per Month			
1987	**1.0**	3.1	3.9
1988	**5.4**	**5.6**	**2.9**
1989	**2.2**	**2.6**	**4.1**
1990	**12.9**	**4.6**	**4.0**
1991	**3.6**	**9.2**	**4.8**
1992	2.8	5.0	2.3

Table 2-51: OLS Results for the (Log) Number of Monthly Hospital Days for Delivery Stays, SSI Enrollees

| | Delivery Stays | |
	San Mateo	Santa Barbara
SSI Enrollees (n =291)		
1988	0.405	-0.236
1989	-0.205	-0.187
1990	0.484	0.070
1991	-0.121	-0.251
1992	0.060	0.471

Note: Estimated effects are relative to Ventura County; omitted year in interaction effects is 1987.
* indicates statistically significant difference at the 0.01 level.
** indicates statistically significant difference at the 0.001 level.

Table 2-52: Mean Monthly Medicaid Spending Among All Enrollees and Among Users of Services Over Time. SSI Adults and Children

| | SSI Children | | | SSI Adults | | |
	San Mateo	Santa Barbara	Ventura	San Mateo	Santa Barbara	Ventura
Mean Real Monthly Medicaid Spending Among All Enrollees						
1987	263.74	138.50	131.80	154.25	149.09	107.36
1988	113.59	69.41†	101.37	120.62	65.14†	93.86
1989	83.95	203.97	173.21	103.82	181.46	136.26
1990	27.66†	213.95	74.35†	57.50†	183.96	78.82†
1991	119.67	185.80	101.66	103.00	158.99	125.27
1992	93.29	290.50	114.92	111.89	160.02	145.63
Mean Real Monthly Medicaid Spending Among Users of Services						
1987	763.26	307.28	286.33	305.16	325.55	199.99
1988	284.11	345.95	219.19	229.05	364.81	176.57
1989	231.36	358.00	408.11	204.90	321.84	252.40
1990	112.90	386.98	272.32	139.68	322.83	182.30
1991	321.74	350.64	227.63	215.42	279.63	233.82
1992	244.01	548.29	229.96	225.43	278.23	253.21

† The discrepancy is likely due to reporting anomalies during the year.

**Table 2-53: Multivariate Regressions for (Log) Monthly Real Medicaid Spending,
SSI Adults and Children**

Months	Random Effects Results	
	San Mateo	Santa Barbara
SSI Children (patients = 1785, obs = 58,731)		
1-12	0.119	0.139
13-24	-0.546**	0.046
25-36	-0.873**	-0.007
37-48	-0.655**	0.489"
49-60	-0.559*	0.645**
61-72	-0.453	1.021**
73-84	----	0.747**
85-96	----	1.484**
97-108	----	2.255**
109-120		1.249**
121-132	---	1.323**
SSI Adults‡ (patients = 7,440, obs = 237,837)		
1-12	0.181	-0.256*
13-24	-0.441**	-0.399**
25-36	-0.570**	-0.317**
37-48	-0.541**	-0.212
49-60	-0.584**	-0.07 1
61-72	-0.5 10**	-0.069
73-84	----	-0.571**
85-96	----	0.528**
97-108	---	1.085**
109-120		0.507**
121-132	----	0.764**

Note: Estimated effects are relative to Ventura County; omitted year in interaction effects is 1987.
† 'The discrepancy is likely due to reporting anomalies during the year.
‡ Multivariate results based on 25% random sub-sample of patients.
* indicates statistically significant difference at the 0.01 level.
** indicates statistically significant difference at the 0.001 level.

5.2.5 SSI Summary

The results for SSI enrollees reveal the benefit of our multivariate model: had we simply
explored the apparent differences in utilization based on the year-by-year average per-person
levels, we would not have observed the dramatic pattern of utilization that emerged when
managed care enrollment was interacted with the linear spline of time enrolled. For ambulatory
care, laboratory and radiology services, and medications we observed during the first year of
enrollment, managed care enrollees generally received equivalent or higher levels of care relative
to first-year FFS enrollees. However, during subsequent years of enrollment, managed care
enrollees exhibited lower levels of utilization relative to their FFS counterparts. Cost of care also
exhibited the same pattern of equivalent or higher levels during the first year of enrollment,
followed by significantly lower levels during subsequent years. The pattern is virtually a

textbook demonstration of the expected impact of managed care: initially patients may receive more care, but over time patients enrolled in the managed care program benefit from the knowledge and familiarity of providers and, as a result, fewer services are required relative to comparably enrolled FFS patients.

The results were not without interesting trends, however. For instance, San Mateo adult enrollees exhibited higher levels of ER care. In addition, managed care enrollees exhibited higher levels of inpatient admissions. Both results are in contrast to established findings in the literature regarding the impact of MMC. The results may be indicative that access to care was compromised for some SSI enrollees or that some patients became dissatisfied with their primary care providers under managed care and therefore did not make necessary primary care contacts leading to higher levels of ER and inpatient care.

5.3 Other Enrollees

Other enrollees are comprised of pregnant women and children eligible under **poverty-**related expansion categories, Ribicoff child and the medically needy, and undocumented **aliens.**[6] As such, they are a diverse group with diverse needs for whom greater care management might prove beneficial.

5.3.1 **Access** to Care

As with AFDC and SSI enrollees, we infer access to care differences by investigating the differences in the use of ambulatory care, examining the differences in setting of ambulatory care, examining the incidence and extent of ER care, and estimating rates of hospitalizations for ACSCs.

Total Ambulatory Cure. Santa Barbara and San Mateo counties had significantly lower levels of ambulatory care use among non-AFDC and non-SSI enrollees relative to Ventura (ignoring the impact of the anomalous reporting in Ventura during 1990). The effect was particularly pronounced as utilization by expansion groups appeared to surge in Ventura in 1.992. Tables 2-54 and 2-55 show that ambulatory care use was significantly lower for children over time under managed care. The results for ambulatory use by Other enrollees are generally similar to the results for AFDC enrollees.

Setting of Cure. Table 2-57 reveals that all three counties reduced the extent to which the doctor's office was the dominant setting of care in favor of clinics (in Other/Unknown). The reduction in the proportion of care rendered in doctors' offices for Other enrollees was quite dramatic in Santa Barbara and Ventura, as proportions fell by nearly 50 percent within six years. In general health clinics appeared to become the dominant setting of care for Other enrollees.

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[6] **Undocumented aliens are covered for a more limited set of services than other Medi-Cal eligibles.**

Table 2-54: Percentage of Enrollee-Months with at Least One Ambulatory Care Day and Number of Ambulatory Care Days per Month Among Users Over Time, Other Adults and Children

	Other Children			Other Adults		
	San Mateo	Santa Barbara	Ventura	San Mateo	Santa Barbara	Ventura
Percentage of Enrollee-Months with Ambulatory Care						
1987	20.8	13.2	21.9	30.9	18.7	27.3
1988	19.2	5.8†	23.3	28.5	10.7-f	31.6
1989	20.9	17.7	25.7	26.3	28.4	32.3
1990	21.1	16.5	10.5-f	24.1	26.1	16.8†
1991	21.8	15.8	26.4	29.3	23.7	20.1
1992	22.7	15.4	34.5	33.3	21.1	50.0
Mean Number of Ambulatory Care Days per Month Among Enrollees with Events						
1987	1.66	1.40	1.66	1.89	1.51	1.90
1988	1.78	1.45	1.62	2.26	1.58	2.10
1989	1.63	1.43	1.61	1.98	1.67	2.06
1990	1.51	1.43	1.65	1.91	1.76	1.86
1991	1.49	1.44	1.58	2.02	1.70	2.06
1992	1.54	1.44	1.65	2.22	1.64	2.09

† The discrepancy is likely due to reporting anomalies during the year.

ER care use results were mixed. Table 2-58 reveals that the proportion of care occurring in ERs for Other enrollees fell over time.- Multivariate results in Table 2-59 show that consistently lower levels of ER care were observed in the managed care counties for children, and sporadically for adults in Santa Barbara. As with the AFDC and SSI subgroups, San Mateo adults appeared to have significantly higher levels of ER visits relative to Ventura. The results could indicate an endemic feature of health care provision in San Mateo County or could be a failure of adequate access to primary health care under HPSM.

Hospital Stays for Ambulatory Care Sensitive Conditions. Descriptive results observed in Table 2-60 suggest, surprisingly, that Ventura Other enrollees had generally lower rates of ACSC hospitalizations relative to San Mateo and Santa Barbara enrollees. It is also possible that Other enrollees in Ventura had more hospitalizations overall, relative to San Mateo and Santa Barbara. The multivariate results in Table 2-61 suggest that there were no significant differences in rates of ACSC hospitalizations between the managed care and FFS counties.

Table 2-55: Multivariate Results for the Occurrence of a Monthly Medical Event, Other Adults and Children

Months	Random Effects Probit Results	
	San Mateo	Santa Barbara
Other Children‡ (patients = 9,180, obs = 131,254)		
1-12	-0.054**	-0.067**
13-24	-0.084**	-0.092**
25-36	-0.108**	-0.106**
37-48	-0.103**	-0.082**
49-60	-0.068**	-0.064**
61-72	-0.186	-0.091**
73-84	---	-0.04 1
85-96		0.033
97-108		0.135**
109-120		0.256**
121-132		0.128*
Other Adults (patients = 8,654, obs = 84,298)		
1-12	-0.032**	-0.103**
13-24	-0.110**	-0.112**
25-36	-0.089**	-0.141**
37-48	-0.027	0.173
49-60	-0.148**	-0.228**
61-72	-1.270	-0.069
73-84	---	-0.128
85-96	----	0.042
97-108	___	0.185
109-120	- -	-0.223
121-132	- -	-0.03 1

Note: Estimated effects are relative to Ventura County.

§ Results displayed are marginal (probability) effects based on mean values of regressors.

‡ Multivariate results based on 25% random sub-sample of patients.

* indicates statistically significant difference at the 0.01 level.

** indicates statistically significant difference at the 0.001 level.

Table 2-56: Multivariate Results for the Number of Monthly Ambulatory Medical Events, Other Adults and Children

| Months | Random Effects Results | |
	San Mateo	Santa Barbara
Other **Children‡** (patients = 9,180, obs = 131,254)		
1-12	-0.115**	-0.149**
13-24	-0.126**	-0.188**
25-36	-0.198**	-0.212**
37-48	-0.184**	-0.149**
49-60	-0.180**	-0.162**
61-72	-0.228	-0.147**
73-84	----	-0.058
85-96	----	0.039
97-108	---	0.179**
109-120	___	0.472**
121-132	----	0.267**
Other Adults (patients = 8,654, obs = 84,298)		
1-12	-0.057	-0.247**
13-24	-0.281**	-0.255**
25-36	-0.277**	-0.275**
37-48	-0.126	-0.344**
49-60	-0.442**	-0.502**
61-72	-1.542	-0.461**
73-84	----	-0.573**
85-96	- -	-0.390
97-108	----	0.112
109-120	___	-1.072**
121-132	- -	-0.712

Note: Estimated effects are relative to Ventura County.
‡ Multivariate results based on 25% random sub-sample of patients.
* indicates statistically significant difference at the 0.01 level.
** indicates statistically significant difference at the 0.001 level.

Table 2-57: Percentage Distribution of Monthly Ambulatory Care Days by Setting of Care, Over Time, Other Adults and Children

	Office	Outpatient Department	Emergency Room	Other/Unknown
San Mateo				
1987	36.2	36.1	13.8	14.0
1988	42.2	29.8	13.3	14.7
1989	33.7	22.5	10.8	33.1
1990	31.5	24.8	10.1	33.6
1991	28.6	28.5	11.5	31.4
1992	31.6	26.8	11.4	30.1
Santa Barbara				
1987	73.9	6.6	12.2	7.4
1988	61.8	8.3	12.0	17.9
1989	57.2	4.8	10.1	27.8
1990	51.2	4.9	9.8	34.2
1991	46.8	4.0	9.8	39.4
1992	44.1	3.3	9.4	43.1
Ventura				
1987	59.4	24.6	11.7	4.3
1988	52.2	28.5	12.7	6.6
1989	43.4	27.7	10.6	17.4
1990	43.9	23.6	10.3	17.3
1991	40.3	26.5	10.5	20.7
1992	33.3	29.6	9.1	19.0

Table 2-58: Percentage of Enrollee-Months with at Least One ER Visit and Number of ER Visits per Month Among Users Over Time, Other Adults and Children

	Other Children			Other Adults		
	San Mateo	Santa Barbara	Ventura	San Mateo	Santa Barbara	Ventura
Percentage of Enrollee-Months with an ER Visit						
1987	**4.4**	1.9	**3.3**	**4.5**	**3.3**	**5.5**
1988	**3.4**	0.9-t	**3.9**	**5.8**	1.8†	6.1
1989	3.0	2.9	3.5	5.0	5.0	5.9
1990	2.8	2.7	1.5	3.4	5.5	2.1
1991	3.2	2.7	3.8	5.7	5.5	2.8
1992	3.4	2.7	4.9	7.0	5.1	4.4
Mean Number of ER Visits per Month Among Enrollees with Events						
1987	**1.23**	1.08	1.34	1.00	1.18	1.60
1988	**1.22**	1.11	1.31	1.36	1.15	1.52
1989	1.18	1.09	1.28	1.22	1.13	1.36
1990	1.17	1.12	1.31	1.22	1.13	1.36
1991	1.17	1.12	1.26	1.30	1.11	1.31
1992	1.18	1.15	1.25	1.28	1.19	1.30

† The discrepancy is likely due to reporting anomalies during the year.

Table 2-59: Multivariate Regression Results for the Number of ER Visits per Month Among Users Over Time, Other Adults and Children

Months	Random Effects Results	
	San Mateo	Santa Barbara
Other Children+ (patients = 9,180, obs = 131,254)		
1-12	-0.015**	-0.029**
13-24	-0.004**	-0.020**
25-36	-0.007**	-0.013**
37-48	-0.013**	-0.013**
49-60	-0.010**	-0.019**
61-72	-0.012	-0.017**
73-84	- -	-0.024**
85-96	----	-0.025**
97-108	----	-0.010
109-120	- -	0.017**
121-132	----	-0.006
Other Adults (patients = 8,654, obs = 84,298)		
1-12	0.014**	-0.018**
13-24	0.015**	-0.005
25-36	0.021**	-0.002
37-48	0.016**	0.002
49-60	0.023**	-0.023**
61-72	-0.164**	0.016
73-84	----	-0.013
85-96	----	0.052**
97-108	----	0.198**
109-120	----	-0.154**
121-132	----	-0.022

Note: Estimated effects are relative to Ventura County; omitted year in interaction effects is 1987.
$ Multivariate results based on 25% random sub-sample of patients.
* indicates statistically significant difference at the 0.01 level.
** indicates statistically significant difference at the 0.001 level.

Table 2-60: Percentage of Enrollee-Months with at Least One Hospitalization for ACSC and Percent of Non-Delivery-Related Hospitalizations for ACSCs per Month Over Time, for Other Adults and Children

	Other Children			Other Adults		
	San Mateo	Santa Barbara	Ventura	San Mateo	Santa Barbara	Ventura
Percentage of Enrollee-Months with a Hospitalization for ACSC						
1987	**0.5**	**0.1**	**0.2**	**1.2**	**0.2**	**0.3**
1988	**0.4**	**0.1**	**0.2**	**0.3**	**0.0†**	**0.2**
1989	**0.2**	**0.3**	**0.2**	**0.5**	**0.3**	**0.2**
1990	**0.1**	**0.2**	**0.1**	**0.4**	**0.4**	**0.3**
1991	0.2	0.2	0.2	0.7	0.4	0.1
1992	0.2	0.1	0.2	0.5	0.7	0.2
Percentage of Non-Delivery-Related Hospitalizations for ACSCs						
1987	41.7	14.0	24.8	60.0	30.8	15.6
1988	43.1	26.5	24.7	13.6	0.0†	13.5
1989	36.7	41.3	29.7	25.5	23.1	18.0
1990	36.0	36.8	27.5	31.0	28.6	17.3
1991	41.0	45.4	38.2	39.2	42.9	16.4
1992	41.6	35.1	31.8	31.0	40.0	27.1

† The discrepancy is likely due to reporting anomalies during the year.

5.3.2 **Preventive Care**

Well-Child Visits. As observed in the AFDC sample, well-child visits were substantially more prevalent in Santa Barbara County, though overall rates of compliance with AAP recommendations were low in all three counties. Again, Ventura County was notable because it achieved marked improvements in well-child care use over the period of our study, though part of the reason for the apparent upward trend might be incomplete reporting in 1989 and 1990 in Ventura.

Immunizations. As observed in the AFDC sample, immunization rates for continuously eligible children were noticeably higher in Santa Barbara and showed dramatic increases in Ventura. Encouragingly, compliance rates at the 12 months of age in 1992 in all counties was above 50 percent, though the cell sizes were relatively small.

Pap Smears. Comparisons of pap smear rates among Other enrollees is difficult because of the relatively small sample cell sizes. Interestingly, compliance rates are noticeably higher among Other enrollees relative to both the AFDC and SSI samples. However, due to the low cell sizes, multivariate results failed to converge.

Table 2-61: Multivariate **Results for the Occurrence of an ACSC Hospitalization,
Other Adults and Children**

| Months | Random Effects Probit Results | |
	San Mateo	Santa Barbara
Other Children‡ (patients = 9,180, obs = 131,254)		
1-12	-0.00005	-0.00008
13-24	0.00002	0.00005
25-36	-0.00001	-0.00012
37-48	0.00000	-0.00003
49-60	0.00100	0.00093
61-72	-0.00100	0.00006
73-84	----	-0.00096
85-96	----	0.00103
97-108	----	-0.00003
109-120	mm-	-0.00003
121-132	---	0.00125
Other Adults (patients = 8,654, obs = 84,298)		
1-12	0.0002	0.0002
13-24	0.0002	0.0003
25-36	0.0002	0.0002
37-48	0.0001	0.0002
49-60	0.0000	0.0014
61-72	0.0000	0.0014
73-84	- -	0.0016
85-96	___	0.0001
97-108	----	0.0001
109-120	___	-0.0014
121-132	- -	0.0002

Note: Estimated effects are relative to Ventura County.

§ Results displayed are marginal (probability) effects based on mean values of regressors.

‡ Multivariate results based on 25% random sub-sample of patients.

* indicates statistically significant difference at the 0.01 level.

** indicates statistically significant difference at the 0.001 level.

Table 2-62: Compliance with the AAP Schedule of Health Supervision Visits Among Continuously Enrolled Medicaid Children by Age and Year, Other Enrollees

Year	Santa Barbara			San Mateo			Ventura		
	N	% No Visits	% Full Compliance	N	% No Visits	% Full Compliance	N	% No Visits	% Full Compliance
At 6 Months of Age[1]									
1989	135	32.6	14.1	169	40.2	16.6	204	54.4	3.4
1990	176	21.6	10.8	228	30.7	13.6	312	68.3	1.3
1991	314	21.7	14.3	411	31.6	12.4	1081	34.6	11.8
1992	327	16.5	19.6	466	27.5	13.7	1006	25.1	19.4
All years	952	21.4	15.4	1274	31.1	13.7	2603	36.5	12.8
At 12 Months of Age[2]									
1989	73	9.6	8.2	74	14.9	18.9	69	44.9	2.9
1990	107	4.7	13.1	137	11.0	12.4	218	31.2	1.4
1991	224	6.3	13.9	268	10.1	10.5	764	18.2	8.9
1992	52	7.7	9.6	95	9.5	7.4	183	12.0	14.2
All years	456	6.6	12.3	574	10.8	11.5	1234	21.1	8.0
At 24 Months of Age[3]									
1989	27	11.1	11.1	34	5.9	8.8	51	13.7	0.0
1990	73	1.4	4.1	78	5.1	6.4	157	10.2	1.3
1991	12	0.0	0.0	46	4.4	8.7	79	17.7	5.1
All years	112	3.6	5.4	158	5.1	7.6	287	12.9	2.1

[1] Full compliance at 6 months of age is considered to be 3 visits.
[2] Full compliance at 12 months of age is considered to be 5 visits.
[3] Full compliance at 24 months of age is considered to be 8 visits.

Table 2-63: Marginal Odds Ratios for the Probability of Health Maintenance Visits for Continuously Enrolled Other Children

	6 Mo. Well Child Compliance	Any Well Child Visits At 6 Mos	12 Mo. Well Child Compliance	Any Well Child Visits at 12 Mos
San Mateo				
1989	5.007**	1.724**	7.094**	5.415**
1990	12.738**	5.310**	11.650**	4.265**
1991	1.256	1.193	1.362	2.048**
1992	0.696*	0.908	0.439	1.095
Santa Barbara				
1989	4.373**	2.637**	3.052	7.998**
1990	10.102**	5.310**	8.853**	9.136**
1991	1.266	1.193	1.685*	3.829**
1992	0.937	0.908	0.692	1.344**

* indicates statistical significance at the 5% level.
** indicates statistical significance at the 1% level.

Table 2-64: Compliance with the AAP Schedule of Childhood Immunizations Among Continuously Enrolled Medicaid Children by Age and Year, Other Children

Year	Santa Barbara N	% No Shots	% Full Compliance	San Mateo N	% No Shots	% Full Compliance	Ventura N	% No Shots	% Full Compliance
At 6 Months of Age'									
1989	135	33.3	33.3	169	46.2	21.3	204	63.2	8.8
1990	176	25.0	34.7	228	34.7	28.1	312	68.3	8.7
1991	314	22.0	45.5	411	34.6	35.8	1081	33.1	28.7
1992	327	17.7	49.5	466	31.1	32.8	1006	21.9	47.6
All years	952	22.7	43.2	1274	34.9	31.4	2603	35.3	32.0
At 12 Months of Age[2]									
1989	73	15.1	39.7	74	17.6	39.2	69	56.5	8.7
1990	107	9.4	45.8	137	17.5	32.1	218	43.1	7.8
1991	224	11.6	47.8	268	13.8	37.3	764	18.2	26.7
1992	52	9.6	61.5	95	12.6	52.6	183	9.8	51.4
All years	456	11.4	47.6	574	15.0	38.9	1234	23.5	26.0
At 24 Months of Age'									
1989	27	3.7	48.2	34	8.8	17.7	51	11.8	0.0
1990	73	1.4	32.9	78	5.1	28.2	157	8.3	8.9
1991	12	0.0	25.0	46	10.9	28.3	79	11.4	12.7
All years	112	1.8	35.7	158	7.6	25.9	287	9.8	8.4

[1] Full compliance at 6 months of age is considered to be 2 DTP, 2 OPV, and 0 MMR immunizations.
[2] Full compliance at 12 months of age is considered to be 3 DTP, 2 OPV, and 0 MMR immunizations.
[3] Full compliance at 24 months of age is considered to be 4 DTP, 3 OPV, and 1 MMR immunizations.

Table 2-65: Marginal Odds Ratios for the Probability of Immunizations for Continuously Enrolled Other Children

	6 Month Immuniz. Compliance	Any Immuniz. At 6 Months	12 Month Immuniz. Compliance	Any Immuniz. At 12 Months
San Mateo				
1989	2.738**	2.038**	5.996**	6.499**
1990	4.531**	4.261**	5.921**	4.050**
1991	1.426**	0.957**	1.659**	1.348
1992	0.61 1**	0.655**	1.037	0.685
Santa Barb				
1989	5.043**	3.688**	7.53**	7.971**
1990	5.919**	6.762**	10.280**	8.510**
1991	2.230**	1.879**	2.585**	1.970**
1992	1.007	1.192	1.037	0.925

* indicates statistical significance at the 5% level.
** indicates statistical significance at the 1% level.

Table 2-66: Percentage of Continuously Enrolled Women Aged 18-39 Years with a Pap Smear by Time Enrolled and Year, Other Adults

Year	Santa Barbara			San Mateo			Ventura		
	N	% No Pap Smears	% Full Compli-ance	N	% No Pap Smears	% Full Compli-ance	N	% No Pap Smears	% Full Compli-ance
At 12 Months of Eligibility'									
1987	23	78.3	21.7	12	100.0	0.0	30	73.3	26.7
1988	12	75.0	25.0	12	58.3	41.7	9	77.8	22.2
1989	9	77.8	22.2	20	95.0	5.0	12	91.7	8.3
1990	14	78.6	21.4	13	76.9	23.1	16	93.8	6.2
1991	10	70.0	30.0	22	86.4	13.6	72	68.1	31.9
1992	3	66.7	33.3	4	100.0	0.0	5	80.0	20.0
All years	71	76.1	23.9	83	85.5	14.5	144	75.0	25.0
At 24 Months of Eligibility*									
1987	8	50.0	0.0	5	100.0	0.0	9	55.6	11.1
1988	1	0.0	100.0	5	20.0	40.0	3	33.3	33.3
1989	2	50.0	50.0	9	88.9	0.0	2	50.0	50.0
1990	4	50.0	0.0	1	100.0	0.0	7	100.0	0.0
1991	0	__	---	1	0.0	100.0	10	70.0	10.0
All years	15	46.7	13.3	21	71.4	14.3	31	67.7	12.9

[1] Full compliance is 1 pap smear.
'Full compliance is 2 pap smears.

5.3.3 Patterns of Health Service Use

Laboratory and Radiology Services. Outpatient visits with laboratory and radiology services were consistently lower among Other enrollees in the managed care counties. However, in Santa Barbara the lower use rates are likely because of incomplete reporting laboratory and radiology services in the early years of the study. The result for children appears to stem from a lower monthly incidence of laboratory and radiology services in San Mateo and Santa Barbara counties, as seen in Table 2-67. The result is consistent with our hypothesis concerning managed care: as patients enter a care management system, there will be less need for repeated testing because information regarding the patient is more available.

Medications. As observed in the AFDC sample, Tables 2-69 and 2-70 suggest that San Mateo Other adult and child enrollees have less frequent incidence of medication use, but higher quantities of medications conditional on their occurrence relative to Santa Barbara and Ventura. Overall for Other child enrollees, the multivariate results indicate significantly lower levels of medication use. For adult Other enrollees the results present no consistent themes in the level of medication use.

Table 2-67: Percentage of Enrollee-Months with at Least One Ambulatory Care Day with Laboratory and Radiology Services and the Number of Ambulatory Care Days with Laboratory and Radiology Services per Month Among Users Over Time, for Other Adults and Children

	Other Children			Other Adults		
	San Mateo	Santa Barbara	Ventura	San Mateo	Santa Barbara	Ventura
Percentage of Enrollee-Months with Ambulatory Laboratory/Radiology Services						
1987	**5.7**	0.0†	**7.2**	**12.8**	0.4†	**15.7**
1988	6.3	0.2†	6.8	14.8	1.4†	18.5
1989	5.5	0.6†	8.6	14.4	5.2†	18.8
1990	4.6	1.6†	3.7	13.3	7.1†	9.5
1991	4.5	3.9	8.3	16.1	15.2	12.0
1992	4.7	3.4	11.2	19.3	12.5	30.9
Mean Number of Ambulatory Care Days with Laboratory/Radiology Services						
1987	1.38	1.17	1.26	1.55	1.00	1.52
1988	1.37	1.40	1.31	1.52	1.39	1.60
1989	1.38	1.31	1.25	1.45	1.42	1.60
1990	1.29	1.20	1.25	1.42	1.32	1.42
1991	1.31	1.23	1.21	1.50	1.40	1.53
1992	1.35	1.24	1.23	1.69	1.37	1.54

† The discrepancy is likely due to reporting anomalies during the year.

Table 2-68: Multivariate Regression Results for the Number of Ambulatory Care Days with Laboratory and Radiology Services per Month, Other Adults and Children

Months	Random Effects Results	
	San Mateo	Santa Barbara
Other Children‡ (patients = 9,180, obs = 131,254)		
1-12	-0.046**	-0.072**
13-24	-0.065**	-0.096**
25-36	-0.071**	-0.079**
37-48	-0.054**	-0.045**
49-60	-0.058**	-0.059**
61-72	-0.052	-0.041**
73-84	----	-0.037**
85-96	----	-0.026**
97-108	----	-0.0003
109-120	----	0.061**
121-132	----	0.082**
Other Adults (patients = 8,654, obs = 84,298)		
1-12	-0.049**	-0.182**
13-24	-0.070**	-0.123**
25-36	-0.055**	-0.085**
37-48	-0.025	-0.063**
49-60	-0.206**	-0.139**
61-72	-0.602*	-0.122**
73-84	----	-0.122*
85-96	----	-0.034
97-108	---	0.419**
109-120	----	-0.166
121-132		0.033

Note: Estimated effects are relative to Ventura County; omitted year in interaction effects is 1987.
‡ Multivariate results based on 25% random sub-sample of patients.
* indicates statistically significant differences at the 0.01 level.
** indicates statistically significant differences at the 0.001 level.

Table 2-69: Percentage of Enrollee-Months with at Least One Medication and the Number of Medications per Month Among Users Over Time, Other Adults and Children

	Other Children			Other Adults		
	San Mateo	Santa Barbara	Ventura	San Mateo	Santa Barbara	Ventura
Percentage of Enrollee-Months with a Medication						
1987	**8.7**	**8.1**	**13.6**	**10.3**	**9.9**	**14.4**
1988	**8.3**	**2.9†**	**14.3**	**12.7**	**3.5†**	**16.5**
1989	**7.4**	**12.6**	**13.5**	**13.6**	**15.4**	11.1
1990	8.3	12.0	13.0	15.4	17.9	16.3
1991	9.2	13.0	14.3	15.8	18.9	**9.6†**
1992	10.0	14.7	20.4	18.2	20.2	21.6
Mean Number of. Medications per Month						
1987	**2.31**	1.51	1.96	3.12	1.74	2.07
1988	2.12	1.59	1.93	2.63	2.02	2.05
1989	2.18	1.55	2.00	2.49	1.99	1.96
1990	2.3 1	1.62	2.03	2.99	2.11	2.14
1991	2.10	1.67	2.14	3.18	2.14	2.26
1992	2.25	1.69	2.25	2.98	2.25	2.19

† The discrepancy is likely due to reporting anomalies during the year.

Hospital Stays. As before, in Tables 2-71 through 2-74 we examine non-delivery hospitalizations in descriptive and multivariate models. We observe that hospital admissions are somewhat difficult to interpret, but it appears that most Santa Barbara children and some adults had lower rates of admissions relative to Ventura. As seen in the AF'DC sample, Other adults in San Mateo had significantly higher rates of inpatient admissions. However, length of stay regressions presented no clear direction for the effect of managed care.

Results for delivery stays, displayed in Tables 2-75 and 2-76, indicate no significant differences between managed care and FFS during our study period.

Table Z-70: **Multivariate Results for the Number of Monthly Medications,
Other Adults and Children**

| Months | Random Effects Results | |
	San Mateo	Santa Barbara
Other **Children‡** (patients = 9,180, obs = 131,254)		
1-12	-0.123**	-0.146**
13-24	-0.163**	-0.203**
25-36	-0.195**	-0.205**
3748	-0.055	-0.077**
49-60	0.105*	-0.074*
61-72	0.157	-0.127**
73-84	- -	-0.126**
85-96	----	-0.02 1
97-108	----	0.172**
109-120	----	0.258**
121-132	----	0.106
Other Adults (patients = 8,654, obs = 84,298)		
1-12	0.025	-0.038
13-24	-0.155**	-0.046
25-36	-0.244**	-0.091
37-48	0.297**	-0.048
419-60	0.162	-0.083
61-72	-1.020	-0.248*
73-84	----	-0.375**
85-96	----	-0.189
97- 108	----	0.323
109-120	----	-0.114
121-132	----	0.274

Note: Estimated effects are relative to Ventura County; omitted year in interaction effects is 1987.
‡ Multivariate results based on 25% random sub-sample of patients.
* indicates statistically significant difference at the 0.01 level.
** indicates statistically significant difference at the 0.001 level.

Table 2-71: Percentage of Enrollee-Months with at Least One Surgery-Related Hospital Event and the Total Number of Hospital Days for Surgery-Related Hospital Events ner Month Among Users Over Time. Other Adults and Children

	Other Children			Other Adults		
	San Mateo	Santa Barbara	Ventura	San Mateo	Santa Barbara	Ventura
Percentage of Enrollee-Months with a Surgery-Related Hospital Event						
1987	0.3	0.1	0.2	0.0	0.3	0.7
1988	0.3	0.1	0.2	0.9	0.2	0.8
1989	0.2	0.1	0.2	0.7	0.7	0.7
1990	0.1	0.1	0.2	0.5	0.5	0.6
1991	0.1	0.1	0.1	0.7	0.5	0.2
1992	0.2	0.1	0.2	0.3	0.3	0.3
Mean Number of Hospital Days for Surgery-Related Hospital Events per Month						
1987	9.0	12.9	8.3	0.0	5.3	5.6
1988	14.3	3.6	15.3	10.1	5.2	11.2
1989	13.1	8.1	12.9	6.2	5.3	14.7
1990	10.3	22.6	8.4	7.4	12.4	5.4
1991	5.9	5.0	7.1	9.7	19.5	4.4
1992	18.9	5.5	11.0	6.6	6.3	10.0

Table 2-72: Percentage of Enrollee-Months with at Least One Medical-Related Hospital Event and the Total Number of Hospital Days for Medical-Related Hospital Events per Month Among Users Over Time, Other Adults and Children

	Other Children			Other Adults		
	San Mateo	Santa Barbara	Ventura	San Mateo	Santa Barbara	Ventura
Percentage of Enrollee-Months with a Medical-Related Hospital Event						
1987	1.0	0.3	0.4	2.1	0.2	0.4
1988	0.6	0.1	0.5	0.8	0.3	0.7
1989	0.4	0.5	0.5	0.9	0.6	0.4
1990	0.3	0.3	0.3	0.4	0.7	0.7
1991	0.4	0.2	0.3	1.2	0.2	0.2
1992	0.4	0.2	0.4	0.7	1.1	0.3
Mean Number of Hospital Days for Medical-Related Hospital Events per Month						
1987	10.9	5.5	10.6	2.2	7.2	2.2
1988	10.9	6.2	8.9	8.1	3.1	4.1
1989	5.8	6.0	7.9	8.3	14.1	2.3
1990	6.9	6.3	11.6	7.5	7.0	6.4
1991	7.8	4.0	8.1	6.8	2.2	7.3
1992	13.4	5.3	5.9	6.9	3.6	6.0

Table 2-73: Multivariate Results for the Number of Monthly Inpatient Hospital Admissions for Surgical/Medical Stays, Other Adults and Children

Months	Random Effects Results	
	San Mateo	Santa Barbara
Other Children‡ (patients = 9,180, obs = 131,254)		
1-12	-0.005**	-0.004**
13-24	-0.0001	-0.003**
25-36	-0.001**	-0.005**
37-48	0.002**	-0.004**
49-60	0.007**	-0.003**
61-72	-0.001	0.0002
73-84	----	0.004**
85-96	- -	-0.0005
97-108	----	-0.003**
109-120	----	-0.0006
121-132	----	0.035**
Other Adults (patients = 8,654, obs = 84,298)		
1-12	0.002**	-0.005**
13-24	0.003**	-0.002**
25-36	0.002**	0.001**
37-48	0.010**	0.010**
49-60	0.010**	0.007**
61-72	-0.032**	0.014
73-84	---	0.012**
85-96	----	0.014**
97-108	----	0.013**
109-120	-a-	-0.012**
121-132	- -	0.050**

Note: **Estimated** effects are relative to Ventura County; omitted year in interaction effects is 1987.
‡ Multivariate results based on 25% random sub-sample of patients.
* indicates statistically significant difference at the 0.01 level.
** indicates statistically significant difference at the 0.001 level.

Table 2-74: OLS Regressions for (Log) Number of Inpatient Days for Surgical/Medical Events, Other Adults and Children

	Length of Surgical/Medical Stay	
	San Mateo	Santa Barbara
Other Children (n =2,552)		
1988	0.117	-0.200
1989	-0.126	0.002
1990	**-0.421****	-0.136
1991	-0.007	-0.33 1*
1992	**0.362****	-0.204
Other Adults (n = 826)		
1988	**0.137**	**-0.409**
1989	**0.049**	**-0.116**
1990	**0.189**	**0.002**
1991	**0.125**	**-0.093**
1992	**0.157**	**-0.334**

Note: Estimated effects are relative to Ventura County; omitted year in interaction effects is 1987.
* indicates statistically significant difference at the 0.01 level.
** indicates statistically significant difference at the 0.001 level.

Table 2-75: Percentage of Enrollee-Months with at Least One Delivery-Related Hospital Event and the Total Number of Hospital Days for Delivery-Related Hospital Events per Month Among Users Over Time, Other Enrollees

	San Mateo	Santa Barbara	Ventura
Percentage of Enrollee-Months with a Delivery-Related Hospital Event			
1987	1.8	2.1	2.5
1988	1.3	1.2	3.3
1989	1.7	3.2	4.5
1990	1.6	2.7	2.6
1991	1.3	2.1	2.5
1992	1.3	?.8	5.6
Mean Number of Hospital Days for Delivery-Related Hospital Events per Month			
1987	1.8	2.6	2.8
1988	2.8	2.3	3.7
1989	3.5	2.9	2.7
1990	3.6	2.9	3.0
1991	2.5	2.8	3.3
1992	2.2	2.6	2.9

Table 2-76: OLS Regressions for (Log) Number of Inpatient Days for Delivery-Related Hospitalizations, Other Adults and Children

| | Delivery Stays | |
	San Mateo	Santa Barbara
Other Enrollees (n = 3189)		
1988	0.205	0.218
1989	0.222	-0.05 1
1990	0.050	-0.181
1991	-0.020	-0.181
1992	-0.122	-0.095

Note: Estimated effects are relative to Ventura County; omitted year in interaction effects is 1987
* indicates statistically significant difference at the 0.01 level.
** indicates statistically significant difference at the 0.001 level.

Table 2-77: Mean Monthly Medicaid Spending Among All Enrollees and Among Users of Services Over Time, Other Adults and Children

| | Other Children | | | Other Adults | | |
	San Mateo	Santa Barbara	Ventura	San Mateo	Santa Barbara	Ventura
Mean Real Monthly Medicaid Spending Among All Enrollees						
1987	112.32	26.84	45.12	69.48	53.93	85.43
1988	52.83	21.40	47.84	105.18	30.95†	132.77
1989	31.95	31.94	53.23	85.82	133.69	139.74
1990	19.74	30.05	31.40	68.53	147.62	89.83
1991	22.07	16.09	32.63	101.07	99.90	72.79
1992	25.63	15.32	43.96	80.12	66.17	174.80
Mean Real Monthly Medicaid Spending Among Users of Services						
1987	499.94	180.05	181.18	211.05	256.13	259.24
1988	254.9 1	339.29	180.25	341.45	284.27	348.98
1989	182.86	158.62	189.48	275.81	421.65	382.73
1990	116.76	161.62	162.81	228.45	439.66	318.79
1991	118.81	78.58	114.74	297.52	296.48	319.26
1992	127.97	67.22	118.16	204.67	196.49	316.36

† The discrepancy is likely due to reporting anomalies during the year,

5.3.4 Medi-Cal Expenditures

The results for Medi-Cal spending present a picture of generally reduced spending under managed care. The descriptive results suggest that the managed care counties spent significantly less on Other children. Spending differences for Other children averaged between 20 and 40 percent lower in San Mateo and Santa Barbara relative to Ventura; the descriptive results are borne out in the multivariate results in Table 2-80 for children. For Other adults, both San Mateo and Santa Baɪ ɔaɪa enrollees appeared to generate significantly lower spending levels relative to Ventura, particularly in the first three years of enrollment.

Table 2-78: Multivariate Regressions for (Log) Monthly Medicaid Spending,
Other Adults and Children

Months	Random Effects Results	
	San Mateo	Santa Barbara
Other Children‡ (patients = 9,180, obs = 131,254)		
1-12	-0.318**	-0.353**
13-24	-0.414**	-0.424**
25-36	-0.472**	-0.422**
37-48	-0.373**	-0.256**
49-60	-0.224	-0.233*
61-72	-0.357	-0.289*
73-84	----	-0.155
85-96	---	0.087
97-108	----	0.527**
109-120	____	0.931**
121-132	___	0.924**
Other Adults (patients = 8,654, obs = 84,298)		
1-12	-0.335**	-0.531**
13-24	-0.607**	-0.460**
25-36	-0.673**	-0.435**
37-48	-0.427	-0.441
49-60	-0.682	-0.529
61-72	-2.465	-0.393
73-84	----	-0.43 1
85-96	----	-0.261
97-108	----	0.480
109-120	____	-0.689
121-132	- -	-0.019

Note: Estimated effects are relative to Ventura County; omitted year in interaction effects is 1987.
‡ Multivariate results based on 25% random sub-sample of patients.
* indicates statistically significant difference at the 0.01 level.
** indicates statistically significant difference at the 0.001 level.

5.3.5 Other Enrollee Summary

The results for non-AFDC and non-SSI Medi-Cal enrollees presented a picture of care that was generally similar to the results for AFDC enrollees. Specifically, Other enrollees in managed care experienced lower levels of ambulatory care, laboratory and radiology services, and medications throughout most of the enrollment duration distribution.

Other enrollee children had relatively low rates of compliance with AAP recommendations for well-child visits and immunizations, and as seen with the AFDC population, Ventura County improved the most dramatically over time. In contrast to the AFDC results, Other enrollees in San Mateo had higher rates of ER visits and inpatient admissions relative to FFS enrollees. The results could indicate inadequate access to care under managed care. However, managed care did appear to reduce spending levels relative to FFS expenditures.

6.   Conclusions

The results of our study of Medi-Cal managed care as represented by three counties with distinctly different experiences present many disparate themes. One overarching conclusion is the critical importance of decomposing the managed care effect by enrollment duration. The results based on the linear spline decomposition of enrollment duration dependence present a very different picture of cost and utilization than would be observed by simply comparing **year**-by-year levels across counties. We observed how the managed care impact varies based on previous enrollment, which also demonstrated the importance of examining the effect of managed care over a long time horizon. Furthermore, had we simply examined one-year effects of managed care, much of the complexity and richness of the effect would have been missed. Table 2-79 summarizes our findings.

One of the recurring themes in the data analysis was the anomalous reporting during some years for some eligibility groups. In some cases the anomalies are clearly evident and the results should be viewed with **skepticism—e.g.** the Santa Barbara laboratory and radiology reporting. In other cases, such as service utilization for SSI eligibles in 1990 for San Mateo and Ventura enrollees, service utilization appeared to be under-reported for certain counties. However, in circumstances when *both* the managed care and the comparison county suffer a similar degree of under-reporting, inferences concerning the relative difference between the counties are not adversely affected, assuming the enrollment patterns did not differ dramatically in the given year. Moreover, the comparison between Santa Barbara and Ventura in 1990 may simply be interpreted as more conservative estimates of the true relationship between the two counties.

Of particular concern is the case of Santa Barbara reporting in 1988, where utilization appeared to be under-reported across all eligibility categories. A fear is that the under-reporting may significantly bias the estimates of the effect of managed care in Santa Barbara relative to Ventura toward finding reductions in service use in Santa Barbara. Our fear is somewhat mitigated because the results presented for SSI adults and children in Santa Barbara indicated that SSI enrollees in Santa Barbara, notwithstanding the under-reporting, had significantly higher levels of utilization (in the first year of enrollment) compared to Ventura **FFS** enrollees, which would not be expected if the under-reporting was severe. As a result, the AFDC Santa Barbara results, which generally indicated lower use relative to FFS, are more credible given that the SSI results did not reveal pronounced effects from under-reporting.

6.1   Access **to Care**

We based our investigation of access on a number of measures, none of which is perfect. The measures included ambulatory care use, ER visits, and incidence of **ACSCs.** Compliance with preventive care guidelines, which is also an indicator of access to care will be considered in the next section. We now summarize the results for each eligibility subgroup.

6.1.1 **AFDC** Enrollees

In general, the results regarding access to care were mixed for AFDC enrollees. AFDC adults and children enrolled in managed care appeared to have lower levels of ambulatory care

Table 2-79: Summary of Monthly Impacts of Medi-Cal Managed Care in San Mateo and Santa Barbara Counties, AFDC, SSI, and Other Enrollees

	AFDC				SSI				Other			
Improving Access to Care												
Any ambulatory care	—		—	—	↘	↘	↘	↘				
Number of ambulatory care days	—		—	—	↘	↘	↘	↘			—	—
Number of ER visits		—			+	—	+	—	+	+	+	+
Any hospitalizations for ACSCs	+	+	0	0	0	0	0	0	0	0	0	0
Promoting Preventive Care												
Compliance with well-child visit schedule	n.a.	n.a.		+	n.a.	n.a	n.a.	n.a.	n.a.	n.a.	—	+
Compliance with immunization schedule	n.a.	n.a.		+	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	—	+
Compliance with annual pap smear	0	0	n.a.	n.a.	0	0	n.a.	n.a.	0	0	n.a.	n.a.
Patterns of Service Use												
Number of visits with lab or x-ray services	—	—			↘	↘	↘	↘				
Number of medications					↘	↘	↘	↘				
Number of admissions for surgical/medical reasons	+	+	+	+	+	m	+	m	+	m	m	—
Number of days for surgical/medical stays	0	0	0	0	+	—	0	0	0	0	m	—
Number of days for delivery stays	—	—	n.a.	n.a.	0	0	n.a.	n.a.	0	0	n.a.	n.a.
Controlling Program Expenditures												
Overall expenditures				—	↘	↘	↘	↘				—

Key: all effects relative to Ventura FFS, 0 indicates no significant results, – indicates generally negative results, + indicates generally positive results, m indicates mixed negative and positive results, ↘ indicates results became negative with longer enrollment duration, n.a. not applicable.

relative to FFS patients enrolled a similar length of time. However, AFDC enrollees also experienced fewer ER visits. In general the results were relatively stable across the enrollment duration distribution. The fact that ER visits were lower in the presence of lower overall levels of ambulatory care for managed care enrollees could suggest that possibly redundant office visits were eliminated. However, there were indications that ACSC hospitalizations were more likely for managed care enrollees, which could suggest inadequate access to care under managed care.

6.1.2 SSI Enrollees

The results for SSI enrollees suggested that under managed care ambulatory care levels were equivalent to or higher than FFS levels among first-year enrollees, possibly indicating improved access to care. However, in subsequent years, ambulatory care levels were lower under managed care relative to FFS. This pattern of care suggested that recently enrolled SSI eligibles received higher levels of ambulatory care in managed care relative to FFS, which may have resulted in the lower levels ambulatory care in subsequent years of enrollment. The result could be the first concrete evidence of managed care organizations behaving in a way that maximizes the long-term health of enrollees. However, the optimism must be tempered by the fact that San Mateo adults had higher levels of ER use relative to adult in Ventura County. No significant difference ir. the rate of admissions for ACSCs was observed. Again the results present a mixed picture of managed care effects on access.

6.1.3 Other Enrollees

Other enrollees appeared to receive lower levels of ambulatory care, and had generally higher levels of ER use. The results could be driven by the fact that many of the non-AFDC and non-SSI enrollees were undocumented aliens, who might be more likely to use ERs. On the whole, access to care by Other enrollees seemed poor under managed care.

6.2   Promoting Preventive Care

We used compliance with AAP recommendations for well-child visits and childhood immunizations as key indicators of preventive care use. In addition, we observed the extent to which women of child-bearing age received an annual pap smear.

6.2.1 AFDC Enrollees

AFDC children appeared to have low overall compliance with AAP recommendations. However, Santa Barbara enrollees, possibly attributable to the County's long-running experience in managed care provision, exhibited significantly higher rates of compliance with well-child visits and immunizations. Ventura County, surprisingly, exhibited the most dramatic improvement over time. Pap smear rates were very low in all three counties. In summary, there is still much work to be done to improve preventive care in all three counties.

6.2.2 SSI Enrollees

EPSDT services were not observed for SSI enrollees; pap smear rates were low in all counties.

6.2.3 Other Enrollees

The results for Other enrollees appeared similar to the results for AFDC enrollees. Specifically, compliance rates for child preventive care were low overall, but highest in Santa

Barbara; Ventura again showed surprising improvements over time. Pap smear rates were similarly low in all three counties.

6.3   Patterns of Service Use

By examining patterns of service use we attempted to identify ways in which managed care affected the health care bundle consumed by patients. In addition to the aforementioned ambulatory care results, we examined the incidence of ambulatory care days with laboratory and radiology services, medications, and the incidence and length of various types of hospitalizations.

6.3.1 AFDC Enrollees

AFDC enrollees in managed care exhibited significantly lower levels of ambulatory care days with laboratory and radiology procedures, as well as lower levels of medications. The results could suggest more efficient or streamlined care, but could also be the result of reduced access to care. Contrary to previous results regarding the impact of managed care, managed care enrollees experienced higher rates of inpatient admissions for surgical and medical procedures, though no significant difference in length of stay. Somewhat interestingly, managed care enrollees exhibited significantly shorter lengths of stay for delivery admissions in 1991 and 1992.

6.3.2 SSI Enrollees

Continuing the pattern of care observed for ambulatory care, SSI enrollees appeared to receive levels of laboratory and radiology services, as well as medications, equivalent to or higher than those received by FFS enrollees. In subsequent years of enrollment, care levels fell. Interestingly, SSI adults and children enrolled longer than three years in Santa Barbara received significantly higher levels of medications. Again the result might be an indication of more appropriate care management of patients in MMC. Results for inpatient admissions were mixed for SSI enrollees, and length of stay for hospitalizations did not differ statistically between managed care enrollees and FFS enrollees.

6.3.3 Other Enrollees

Similar to AFDC enrollees, Other enrollees in managed care exhibited lower levels of laboratory and radiology services and medications relative to FFS enrollees. However, inpatient admission rates were generally higher under San Mateo's managed care plan, but generally lower under Santa Barbara's managed care plan. Length of stay did not differ significantly between Other enrollees in managed care versus those in FFS.

6.4   Controlling Program Expenditures

Finally, one of the hopes of managed care in Medi-Cal is that it will lower costs of care. We summarize our findings for total expenditures below.

6.4.1 AFDC Enrollees

In general, AFDC enrollees under managed care exhibited significantly lower levels of spending. The reductions in spending appeared to diminish with time enrolled, possibly indicating the difficulties associated with managing long-term enrolled populations under managed care or, alternatively, indicating that FFS Medi-Cal may over time implement attributes of managed care.

6.4.2 SSI Enrollees

Expenditures for SSI enrollees exhibited the same pattern seen in other outcome variables: in the first 12 months spending under managed care was equal to or higher than FFS, but in subsequent years the spending levels in managed care were significantly reduced below FFS levels. Again, the result exemplifies the importance of viewing managed care over a sufficiently long time horizon in order to properly gauge its impact.

6.4.3 Other Enrollees

Other enrollees under managed care experienced reductions in spending similar to those found among the AFDC sample. As in the AFDC sample, the spending reductions appeared to dissipate with time enrolled in managed care.

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Chapter 3: Mandatory HMO Enrollment in Montgomery County, Ohio

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1. Introduction

The Ohio Department of Human Services (ODHS), the state agency responsible for administering the Medicaid program in Ohio, took advantage of the 1915(b) waiver in May 1989 when it implemented a mandatory managed care program in Montgomery County (the Greater Dayton area). The Ohio 1915(b) program mandated enrollment in one of three Health Maintenance Organizations (HMOs) among the County's approximately 42,000 Medicaid Aid to Families with Dependent Children (ADC) recipients.'

The Ohio program was chosen for our evaluation because of the accessibility and quality of encounter data from the HMOs and because the State is implementing a comprehensive Medicaid reform program, called OhioCare, with similar features under an 1115 waiver. As of April 1998, mandatory enrollment was in place for the welfare and Healthy Start (pregnant women and children enrolled under the poverty-related expansion categories) populations in seven counties, which include 55 percent of the total State Medicaid population. In October 1998, the mandatory program is scheduled to expand to nine additional counties.

ODHS has contracted with managed care programs since 1978 for the coverage and provision of health services to eligible ADC recipients who wish to voluntarily enroll. In Montgomery County during the 12 months prior to implementation of mandatory HMO enrollment under the 19 15(b) waiver, 41 percent of ADC children and 34 percent of ADC adults enrolled in Medicaid were voluntarily enrolled in HMOs. **This evaluation of the 1915(b) waiver program may provide some valuable lessons for HCFA and the State as it launches the new program statewide and moves from voluntary to mandatory HMO enrollment.**

We assessed the success of Montgomery County's mandatory HMO program for ADC recipients in achieving four goals: (1) improve access to primary health care; (2) promote the use of preventive care services; (3) change patterns of service utilization; and (4) control Medicaid program expenditures. We used several health services utilization and expenditure measures computed from claims and encounter data to provide evidence of the program's success in meeting each of these goals. In addition, for a subset of the service use measures, we also investigated whether the program affected African-American and white enrollees differentially.

A quasi-experimental pre-post, comparison group design was used to compare the levels of and the changes over time in Medicaid service use and expenditures between a sample of ADC recipients in Montgomery County and a sample of ADC recipients in Summit County (the Greater Akron area). We used bivariate and multivariate analytic techniques and analyzed the experience of adults (aged 18 or older) and children (under 18 years of age) separately.

The majority of previous analyses of Medicaid managed care programs have been limited to evaluations of the impact of managed care on Medicaid beneficiaries continuously enrolled

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[1] As of January 1992, mandatory enrollment in Montgomery County was expanded to low-income pregnant women and children enrolled in Medicaid under the State Omnibus Budget Reconciliation Act expansions, known in Ohio as "Healthy Start" eligibles. We did not include these eligibles in the analysis presented in this chapter.

during the analysis period. However, many Medicaid beneficiaries are enrolled for only a short time or go in and out of coverage. To reflect the actual experience faced by States, our sample of Medicaid beneficiaries included part-year enrollees: those who were discontinuously enrolled (disenrolled and reinstated during the year), those who enrolled after the beginning of the 12-month study period, and those who terminated their enrollment before the end of the year.

The rest of this report is comprised of six sections. In the second section, we present the characteristics of the health plans and the study sample. Section 3 delineates the research questions and hypotheses. In section 4, we introduce the research methodology. Empirical findings are presented in section 5 and are summarized in section 6.

2. Background

2.1 Health Plans

During the study period, the ODHS contracted with three HMOs in Montgomery County? The HMOs include one not-for-profit health plan and two proprietary plans. All three are Independent Practice Associations (IPAs). An independent broker manages the mandatory enrollment of eligible beneficiaries into one of the three HMOs. The HMOs have their own outreach programs to help coordinate recipients' medical and social service needs.

The HMOs receive full capitation payment for all covered services.[3] They in turn contract with hospitals, physicians, and other necessary providers. Hospitals and physicians are reimbursed on a variety of payment mechanisms including full capitation, partial capitation, and fee-for-services (FFS). For example, the not-for-profit HMO reimburses its physicians on a FFS basis at 105 percent of Medicaid's FFS level. One of the for-profit HMOs also pays FFS if the provider is the primary care physician (PCP) for fewer than 125 ADC recipients. If a PCP has more than 125 ADC recipients, then the physician is capitated for all his/her ADC recipient HMO enrollees. Furthermore, the PCP is at risk for all specialty care and pharmacy costs, but not for the cost of emergency room visits. The other for-profit HMO capitates all PCPs and has a shared withholding on specialty care costs. All plans capitate hospital clinics, residency clinics, and community clinics. These varied financial arrangements with providers could influence the patterns of service utilization among beneficiaries.

All plans allow PCPs to limit the number of Medicaid patients they accept. However, ODHS requires that a PCP have the capacity to serve at least 50 Medicaid patients to be counted toward the total PCP capacity of the HMO. ODHS also requires that each HMO have a minimum ratio of one full-time-equivalent PCP for each 2,000 Medicaid enrollees served. However, the state has no restriction on the number of privately insured patients Medicaid- or

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[2] Four plan options have existed since July 1996.

[3] The evolution of the program has seen the development of capitation rates using an external actuary and an increasing sophistication related to the inherent sporadic nature of Medicaid eligibility and managed care plan enrollment.

HMO-participating physicians may serve. Providers with high caseloads of privately insured patients may not be as available to Medicaid beneficiaries as those with lower demand from the private sector.

During the site visit in the fall of 1994, a shortages of obstetricians and gynecologists **(OB/GYN)** was noted by all of the health plans. One health plan also indicated that its pediatricians placed more limits on the number of Medicaid patients they would accept. Furthermore, even in the largest HMO in the area, 80 out of 118 **PCPs,** or 68 percent, had restrictions on accepting new Medicaid patients. Such shortage of **PCPs** willing to accept Medicaid patients could impede Medicaid beneficiaries' access to care. Although the health plans were able to contract with local hospitals and community clinics to meet the demand for prenatal care, other primary care and preventive care needs from the Medicaid population might not have been met.

2.2 Study Population

A stratified random sample of the ADC program beneficiaries in Montgomery County during the fiscal year running from June 1992 to July 1993 (FY93) makes up the sample of waiver beneficiaries for our study. The sample was stratified by age group (adult/child), whether they were covered under an HMO or FFS Medicaid during the majority of the analysis year, and whether they were enrolled in Medicaid during May 1988 through April 1989, the 12 months prior to the program's implementation, which serves as the pre-period for our study. The sample from the pre-period was drawn for a previous study of the prior and first-year experience of Montgomery County's 1915(b) waiver (RTI, 1991); the stratification variables were identical to those used in this study.

To reduce the cost of the current analysis, we used the prior year, person-level analysis file from the earlier study as the pre-1915(b)-waiver file for this evaluation. Hence, measures used in the other State reports that require service-level data and that were not computed for the earlier study could not be used or were computed only for the post-period in this analysis. For example, we do not report data on ambulatory diagnostic groups, the cost-mix measure used in the New Mexico and Florida analyses, and we present data on ambulatory care sensitive conditions and preventive care measures for the post-period only.

The non-waiver comparison group consists of a stratified sample of ADC beneficiaries in Summit County in the Greater Akron area of Ohio. These Medicaid beneficiaries received their services on a traditional FFS basis during **5/88-4/89** and FY93. They were matched on age group (adult/child) and race (African-American/non-African-American). Approximately 600 individuals were drawn from each of the four cells in both the pre- and post-periods.

The numbers of individuals from the waiver and non-waiver groups are presented in Table 3-l. In summary, 3,490 adults and 3,414 children from Montgomery County were sampled in the pre-period, whereas 4,082 adults and 3,834 children from Montgomery County were sampled in the post-period. About 1,200 adults and 1,200 children from Summit County were sampled in both the pre- and post-periods.

Table 3-1. Sample Sizes, Montgomery County and Summit County, Ohio, 5/88-4/89 and FY93

	Montgomery County		Summit County	
	5/88-4/89	FY93	5/88-4/89	FY93
Adults	3,490	4,082	1,199	1,200
Children	3,414	3,834	1,200	1,200

The characteristics of the sample of Medicaid beneficiaries are presented in Table 3-2. Information on adults and children are presented separately by county and year. We note that the demographic composition of the sample population was quite comparable for both adults and children between the two counties and over time. However, for Montgomery County in FY93, our sample included slightly more African-American beneficiaries and slightly older children on average. In addition, there were fewer beneficiaries enrolled in Medicaid for the full 12 months of the post-period (59 percent of adults and 7 1 percent of children) compared to the 12 months of the pre-period (71 percent of adults and 76 percent of children). This latter trend was also evident in Summit County.

2.3   HMO Enrollment and Disenrollment

Although enrollment in HMOs was mandatory for ADC recipients in Montgomery County after the waiver, not all eligible Medicaid beneficiaries were enrolled in an HMO during FY93. In our sample of Montgomery County ADC recipients for FY93, 26 percent of adults and 21 percent of children never enrolled in an HMO. Among those who enrolled in an HMO, the patterns of participation vary. Some were enrolled in the HMOs during the full period of their Medicaid enrollment. Some were not enrolled in the HMOs initially but enrolled after a lag time. Others initially enrolled in the HMOs but later withdrew from them while still enrolled in Medicaid.

The lag time between the first of the year or initiation of Medicaid enrollment and HMO enrollment among ADC recipients in Montgomery County in FY93 ranged from one to 11 months and averaged three months; 30 percent of beneficiaries with postponed enrollment had lag times over three months. Several structural factors contributed to these lag times. First was the potential for up to three months of retrospective Medicaid eligibilility, whereas no retrospective managed care enrollment existed. Second was the time between Medicaid eligibility determination and HMO enrollment required to complete the enrollment procedures. Newly eligible individuals were notified of mandatory enrollment and offered time to make a voluntary plan selection. In the early years of the program, every effort was made to allow individuals to select their plan, with assignment to plans often not occurring until after six months of eligibility had passed. While this policy decision enhanced the potential for consumer satisfaction, it also resulted in more months on the FFS program. The third contributing structural factor to the lag time was deferred enrollment in HMOs for hospitalized beneficiaries.

Table 3-2. Demographic and Medicaid Enrollment Characteristics of the Study Sample, Montgomery County and Summit County, Ohio, 5/88-4/89 and FY93

	Montgomery County		Summit County	
	5/88-4/89	FY93	5/88-4/89	FY93
Adults				
Age (mean)	28	28	28	29
Gender				
Female (%)	80	80	79	78
Male (%)	20	20	21	22
Race				
White (%)	52	47	48*	48*
African-American (%)	46	51	50*	50*
Other non-white (%)	2	2	2*	2*
Medicaid Eligibility				
Months of eligibility (mean)	9	8	9	10
Continuously eligible (%)	71	59	75	68
Enrolled in HMOs (%)	35	74	0	0
Children				
Age (mean)	6	8	7	7
Gender				
Female (%)	49	49	49	53
Male (%)	51	51	51	47
Race				
White (%)	48	43	46*	48*
African-American (%)	48	54	50*	50*
Other non-white (%)	4	3	4*	2*
Medicaid Eligibility				
Months of eligibility (mean)	9	9	10	10
Continuously eligible (%)	76	71	82	77
Enrolled in HMOs (%)	35	79	0	0

* The study sample from Summit County was chosen so that 50% were African-American and 50% were non-African-American.

If a hospitalized patient was determined to be eligible for Medicaid, the patient was not cnrolled in an HMO until discharge. During the lag time beneficiaries were covered by FFS Medicaid.

Furthermore, enrollment changes prior to July 1996 could be made on a monthly basis. Moreover, such changes typically involved an interim month or two on FFS before enrollment in the newly selected HMO became effective. Since July 1996, under the 1115 waiver, enrollees are "locked-in" for up to six months and if a change in HMOs is made there is usually no interim FFS month.

To differentiate the levels of HMO participation among Medicaid beneficiaries, we categorized them into four types. The first type was delayed enrollment, for those not enrolled initially then continuously enrolled in an HMO in FY93. The second type of participation was continuous enrollment; these beneficiaries were enrolled in HMOs from the beginning to the end of their Medicaid enrollment or the study period. The third type included those beneficiaries who were initially enrolled in HMOs and then disenrolled. The last type was nonparticipants- those who never enrolled in an HMO during their Medicaid enrollment period in FY93.

A large percentage of the nonparticipants were enrolled in Medicaid during only part of FY93 (Table 3-3); the lag time between eligibility determination and the postponement of HMO enrollment resulted in these Medicaid beneficiaries never enrolling in an HMO during FY93. Nevertheless, 12 percent of the children and 16 percent of the adults in Montgomery County ADC families who were enrolled in Medicaid for 12 months of FY93 never enrolled in an HMO that year.

2.4   Characteristics of HMO and FFS Beneficiaries

Were ADC recipients in one HMO different from ADC recipients enrolled in the other HMOs or from those who remained in FFS Medicaid for their full Medicaid enrollment period in FY93? Did the rates at which ADC recipients disenrolled from HMOs vary by HMO? To address these issues, we tabulate the enrollees' demographic characteristics by the three HMOs and by their HMO participation status.

2.4.1   Comparison of Waiver Beneficiaries by Health Plan

As shown in Table 3-3, among adult ADC recipients living in Montgomery County in FY93, except for age, a number of dissimilarities exist across the four groups. For example, a greater percentage of HMO enrollees were female compared to those in FFS Medicaid. HMO B and HMO C-the for-profit HMOs—enrolled disproportionately more African-American than white beneficiaries compared to HMO A, the not-for-profit HMO, and to FFS Medicaid. Furthermore, the average length of Medicaid enrollment was four months among beneficiaries who were only in FFS Medicaid in FY93 compared to 10 months among those enrolled in HMOs at some time during the year.

With respect to children, all four groups had similar aged children and fairly even distribution by gender. The racial composition of ADC children mirrored the adults, as did their length of Medicaid enrollment. Children not enrolled in any HMO averaged five months of

Table 3-3. Demographic and Medicaid Enrollment Characteristics of the Study Sample by Program Status, Montgomery County, Ohio, FY93

	FFS only	HMO A	HMO B	HMO C
Adults				
Age (mean)	28	28	29	28
Gender				
Female (%)	71	82	82	83
Male (%)	29	18	18	17
Race				
White (%)	53	54	34	37
African-American (%)	44	45	65	61
Other non-white (%)	3	1	1	2
Medicaid Eligibility				
Months of eligibility (mean)	4	10	10	10
Continuously eligible (%)	35	65	70	71
Children				
Age (mean)	8	8	9	8
Gender				
Female (%)	47	49	47	50
Male (%)	53	51	53	50
Race				
White (%)	54	50	29	32
African-American (%)	43	47	69	65
Other non-white (%)	3	3	2	3
Medicaid Eligibility				
Months of eligibility (mean)	5	10	11	11
Continuously eligible (%)	39	76	82	84

Medicaid enrollment whereas those enrolled in HMOs had 10 to 11 months of Medicaid enrollment. Less than 40 percent of children in FFS Medicaid were continuously enrolled in Medicaid for the full year as compared to the 76 percent in HMO A and above 80 percent in HMO B and HMO C.

2.4.2 Level of HMO Participation among HMO Enrollees in Different HMOs

As presented in Table 3-4, HMO participation patterns varied across the three HMOs. HMO B had the smallest share of the Medicaid managed care enrollees in FY93. Only 13 percent of adult Medicaid HMO enrollees were in HMO B, whereas 55 percent were enrolled in HMO A and 32 percent were enrolled in HMO C.[4] The distribution across HMOs was similar among children. HMO B had the highest full participation rates among both adults and children, and the lowest rate of delayed enrollment. The disenrollment rates were similar across the three HMOs among both adults and children.

Table 3-4. HMO Participation Levels Among HMO Enrollees, Montgomery County, Ohio, FY93

	Adults			Children		
HMO	A	B	C	A	B	C
Number of Medicaid enrollees	1,647	384	969	1,569	432	1,001
Percent of Medicaid HMO enrollees	55	13	32	52	14	33
Level of HMO participation						
Continuously enrolled (%)	57	68	61	56	64	61
Delayed enrollment (%)	20	12	15	20	14	17
Disenrolled (%)	23	20	23	23	22	22

Some of the disenrolled had re-enrolled in HMOs. Unfortunately, we have no data on the reasons for disenrollment or HMO choice at reenrollment. Hence, we were unable to further investigate disenrollment and subsequent reenrollment issues. We note that enrollment and disenrollment decisions may not have been exogenous to service utilization experience and costs. However, due to the lack of appropriate instrumental variables, we treat HMO participation decisions as independent variables in the regression analyses described later in this report.

3. Research Questions and Hypotheses

We investigated Montgomery County's success in achieving four often stated goals of managed care programs: (1) improve access to primary care; (2) promote the use of preventive services and increase their provision in comparison to FFS; (3) alter service utilization to emphasize the use of primary care, reduce hospitalizations, particularly ambulatory care sensitive conditions (ACSCs), and de-emphasize doctor-shopping; and (4) control expenditures. In addition, we investigated whether mandatory **HMO enrollment had a differential impact on**

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[4] If an individual was enrolled in more than one HMO during FY93, they were assigned to the HMO in which they spent the greater number of months.

African Americans and whites. Our general approach to and specific hypotheses for investigating each of these goals are described in turn below. The measures we used to provide evidence on each goal are summarized in Table 3.5.

Table 3-5. Measures Used to Analyze the Success in Achieving Specific Goals of Mandatory HMO Enrollment Among ADC Recipients, Montgomery County, Ohio, FY93

	Access	Preventive Care	Use Patterns	Cost Control	Minority Impact
Any outpatient days of care	X		X		X
Number of outpatient days of care	X		X		X
Any ER visits	X		X		X
Number of days of care with ER visits	X		X		
Any outpatients laboratory or radiology			X		
Number of days with lab or xray services			X		
Compliance with well-child schedule	X	X			
Compliance with immunization schedule	X	X			
Compliance with annual pap smears	X	X			
Any physician services			X		X
Number of ambulatory care days with physician services			X		X
Any hospital stays			X		X
Number of hospital days			X		X
Number of delivery-related admissions			X		
Number of medical-related admissions			X		X
Number of surgery-related admissions			X		X
Any hospitalizations for ACS conditions	X				
Actual Medicaid payments				X	
Counterfactual payments				X	

3-9

3.1   Access to Care

Access to health care has been measured in various ways-through measures of provider availability (e.g., number of participating providers per 1000 beneficiaries), waiting time to appointments, travel time or distance to care, etc. The Institute of Medicine (IOM) defines access as "the timely use of personal health services to achieve the best possible outcomes" (Millman, 1993). Thus, outcome measures can also be used to reflect the adequacy of access to care (Andersen, 1997; Gold et al., 1995). According to the Health Behavioral Model of Health Services Utilization, a conceptual framework developed by Andersen and colleagues more than two decades ago, "realized" access to care is observed through measures of health service use (Andersen and **Aday,** 1978; **Aday** and Andersen, 198 **1),** with greater use of health services indicating greater access to care. This is particularly true for underserved populations, such as Medicaid   beneficiaries.

However, service use is influenced by more than just the availability and accessibility of services. It also reflects cultural and individual differences and actions taken by programs and providers such as aggressive outreach and education. Often, outreach workers, case workers, and case managers provide encouragement and other services of a sort that cannot be observed or measured. Furthermore, because managed care organizations rely heavily on demand management to achieve cost control, service use is expected to be higher for some services, such as primary and preventive care, but lower for others, such as emergency room (ER) visits and hospitalizations for ACSCs.

Claims/encounter data provide only measures of utilization. As a result, claims data are best used to support or refute evidence on access to care or to add more data when other access measures are collected and assessed; they cannot be used as definitive measures of a program's impact on access to care.

We constructed several service use measures that when viewed together may reflect a pattern of care suggestive of improved access. First, we hypothesized that beneficiaries with access problems would forgo routine primary care. Therefore, if the goal of the program to improve access to routine primary care was met, use of ambulatory care may have increased. However, an increased number of ambulatory days of care alone would not in and of itself signal increased access-i.e., the individual forgoing routine care may have received more illness-related care.

Compromised access to care often results in presentation at **ERs** for inappropriate reasons or in delays or failure to receive needed primary care, which in turn result in ER visits and/or hospitalizations for avoidable ACSCs. Thus, we measure the probability and extent of use of **ERs** and the likelihood and number of hospitalizations for ACSCs. We hypothesize that increases in ambulatory care together with decreases in the amount of ER use and the use of hospitals for ACSCs would indicate improved access. **As** noted below, the actual number of ACSCs was small; as a result, we report the number but did not analyze statistically differences between Summit and Montgomery Counties. (A list of the 35 ACSCs used are provided in Appendix A.)

3.2   Promote Preventive Care

In theory, improvements in the use of preventive care is easier to study than is access to care. Age-specific guidelines for preventive care exist that can be followed and evaluated against actual practice. Furthermore, claims or encounters indicate that certain preventive activities were provided. These include well-child visits, childhood immunizations, and pap smears.

We hypothesize that enrollment in health plans should improve compliance with nationally accepted rates for each of these measures. However, for the Ohio analysis, we were only able to take a cross-sectional look at the measures in the post-period; they were not used in the prior study and therefore were not on the pre-period file. In the cross-sectional comparison, we assessed whether use of these preventive services in Montgomery County was near national standards of care and whether it was better than in Summit County. However, because of the lack of prior year data, we cannot say whether the levels of use constituted improvement over time that resulted from the waiver program.

For well-child visits, we computed an index for preschool-aged children that measures compliance with the schedule of health supervision visits recommended by the American Academy of Pediatrics (AAP). The AAP recommends well-child visits at 1, 2, 4, 6, 9, 12, 15, 18, and 24 months of age and annually for children aged 3, 4, and 5 years. Our index was based on the number of visits (including visits under the Early and Periodic Screening, Diagnostic and Treatment program [EPSDT]) that the child was expected to have had during the year given the child's age at the end of the year and was adjusted for the number of months the child was enrolled in Medicaid during the year. (See Appendix B for a fuller description of how this measure was computed.)

The AAP also recommends that certain childhood immunizations be administered at specific intervals that correspond to the health supervision visits. These immunizations often were billed separately. Thus, we were able to investigate compliance with the AAP periodicity schedules for three immunizations among children aged two to 30 months: (1) the diphtheria-tetanus-pertussis (DTP) series recommended at 2, 4, 6, and 18 months; (2) the oral polio vaccine (OPV) recommended at 2, 4, and 18 months; and (3) the measles, mumps and rubella (MMR) vaccine recommended at 15 months of age. Because children may receive immunizations under other government-funded programs outside of Medicaid, as well as through privately funded sources, the immunization indexes we have computed should not be interpreted as the percentage of children up-to-date in their immunizatons. Rather, the indexes are th percentage of recommended immunizations that were paid for through the Medicaid program.

Finally, we examined the percentage of non-pregnant women (women for whom no prenatal or delivery-related care was found) aged 19-39 years of age who had an annual pap smear. We restricted the analysis to non-pregnant women because pap smears are a part of **prenatal care; eliminating these women gave us a truer measure of "preventive care" service use.**

3.3 Changes in Patterns of Service Use

A fundamental working hypothesis of all administrators and policymakers interested in managed care is that continuous access to high quality primary care leads to reduced need for costly services, especially those that can be avoided or are inappropriate. Because Medicaid beneficiaries historically have lacked both access to primary care and continuity of care, there is every reason to believe that these advantages of managed care would be particularly applicable to Medicaid beneficiaries.

Thus, it would be tempting to hypothesize that Medicaid managed care in Montgomery County led to the use of more routine primary care services and fewer illness-related ambulatory care services, physician services, hospital admissions and inpatient days of care, and laboratory and radiological tests.[5] However, early on in a program, a population with many unmet needs will increase their use of many services before more appropriate care patterns are established. Because we have no data on health status, we cannot control or even attempt to measure unmet need in Montgomery and Summit Counties. It is hard to say which effect predominated-namely whether an existing high unmet need led to more services at least in the beginning or whether there was little unmet need so that we should expect a drop in the counts of these services. As mentioned above, we expected to see fewer ER visits and hospitalizations for **ACSCs.** However, we investigated utilization patterns for ambulatory care, physician services, hospital care, and laboratory and radiology services without predicting whether we expected an increase or decrease in use.

3.4   Health Care Expenditures

Along with improving access to care, it can be argued that expenditure reduction is the most promising aspect of Medicaid managed care. Certainly, expenditure control is the most salient political basis upon which most of these programs "were sold." **Thus** it is hoped that with more primary and preventive care provided in competing health plans and fewer inappropriate laboratory and radiology tests, visits to the ER, and hospitalizations will result and that these changes will in the longer run lead to reduced Medicaid expenditures.

Because the mandatory program in Montgomery County turned from FFS to capitation, whether expenditure reductions were realized depends in large measure on how capitation rates were **set.**[6] Expenditures in Montgomery County are equal to the number of beneficiaries covered times the capitation rate paid for each, plus expenditures for "carved **out"or** "wrap-around" services, and any **FFS** payments made while the person awaited HMO assignment. The rate setting process for capitation payments in Montgomery County was keyed to what FFS payments used to be in the County and what FFS was like in other counties. Thus, by definition, there was

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[5] Prescription drug claims were not provided by one of the **HMOs** and therefore were not examined in **this** analysis.

[6] Staff of the Managed Care Section of the Ohio Bureau of Medical Assistance believe that their ability to accurately develop rates has developed as the program has matured, knowledge of Medicaid managed care reimbursement has grown, and the use of actuarial expertise has risen.

a savings if all Ohio did was reduce payments by some percentage. However, if beneficiaries who delayed enrollment or disenrolled were systematically costlier than those who were continuously enrolled in the HMO, then it is possible that the actual capitation payment was too high, thus increasing total payments (expenditures).

3.5 Racial Differences

Civil rights advocates warned that although managed care has the potential to expand access to care for the poor, it could also lead to new discrimination against minorities (Rosenbaum et al., 1997). Indeed, when providers must compete for covered lives to secure prepaid revenues, managed care could improve access to care to previously underserved populations. On the other hand, capitation payments, unadjusted for risks, can encourage providers to favorably select certain groups of enrollees while denying or withholding care to others.

Managed care has yet to demonstrate that racial discrimination-well documented in the old FFS system—has been eliminated under managed care (Rosenbaum, et al., 1997). Monitoring service use levels between racial and ethnic groups can provide critical information on whether equitable access to health services is compromised. To monitor minority beneficiaries' experience after mandatory HMO enrollment, we assessed whether the program had differential impacts on selected services for African-American versus white Medicaid beneficiaries in Montgomery County. The services included for this study are ambulatory care, physician care, all inpatient admissions, surgery-related admissions, medical-related admissions, and emergency department use.

4.   Methodology

4.1   Data and File Construction

Claims data from the Ohio Medicaid Management Information System (MMIS) and encounter data from the HMOs were the sources of data for this investigation. Our approach in analysis file construction was successfully used in a previous evaluation of the Montgomery County Medicaid managed care program (RTI, 1991). Specifically, a uniform file structure was created based on Medicaid claim file documentation, and the separate files were "mapped" into the uniform structure. The uniform claims were then converted into ambulatory and inpatient events.

We classified and characterized events based on such factors as provider type, place of service, procedural content, dates of services, etc. Events were then accumulated to the person level to provide detailed counts of use in an individual utilization history. For beneficiaries **enrolled in both a Medicaid HMO and FFS Medicaid during an analysis year, we summed use under** the HMO and the FFS plans to produce person-year totals. We extracted personal characteristics of the beneficiaries from the enrollment files.

4.2 Descriptive Analysis

Descriptive assessment of service use and expenditures between Medicaid beneficiaries in Montgomery and Summit Counties were conducted. We compared the probability of any use and the levels of use among users both across the two counties and within each county over time. We then compared the changes over time across the counties (i.e., the difference in differences).[7] By measuring the difference in differences, we were able to examine whether the waiver program had a meaningful impact on health service use and expenditures. Multivariate regression analysis was used to test whether such differences were statistically significant after controlling for the impact of other demographic and Medicaid enrollment characteristics.

4.3   Multiple Regression Analysis Models

A two-part econometric model was used in the regression analysis (Duan, et al., 1983). In the first part, we estimated the probability of observing an outcome measure of interest in a logit analysis. Then, in the second part, we examined the "use among users" in an ordinary least square (OLS). equation. With each part, two models were run: one to measure the county-level program effect of mandatory enrollment and the other to investigate the effects of different HMO participation levels. To achieve normality in the distribution and overcome the skewness of the dependent variables for levels of use and expenditures among users, we used log-transformations of these variables in the OLS regressions.

4.3.1   The Basic Model

The basic analytic model for testing the county-level waiver program effect was a pre-post, comparison group design:

$$Y_{it} = f(\alpha + \beta_T T_t + \beta_E E_{it} + \beta_{TE} TE_{it} + \beta_X X_{it} + \epsilon_{it})$$

where Y_{it} is the dependent variable
      i   indexes the individual
      t   indexes the year
      X_{it} is a vector of covariates that vary over time and across individuals

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[7] The difference in differences (DD) is measured by subtracting the change in the measure of interest from the pre- to the post-period in Summit County from the change in the measure from the pre- to the post-period in Montgomery County:

$$DD = (Y_{post \cdot MC} - Y_{pre \cdot MC}) - (Y_{post \cdot MC} - Y_{pre \cdot MC})$$

A positive sign indicates that the measure increased more (or decreased less) in the waiver county than in the non-waiver county, and a negative sign indicates that it decreased more (or increased less) in the waiver county compared to the non-waiver county. Essentially, if an increase in the measure is considered a desirable program effect, as in the case of preventive care use, then we are looking for a positive sign on the DD. Alternatively, if a decrease in the measure is considered a desirable program effect, as in the case of ER room visits, then we are looking for a negative sign on the DD.

E   indicates if the person lives in Montgomery County (E=1) or Summit County
         (E=0), and

T   indicates if the observation is for FY93 (T=l) or 5/88-4/89 (T=O).

The program effect was estimated by the coefficient of the indicator variable TE that
represents the interaction of the pre-/post-period indicator T and the waiver county indicator E. It
had the value 1 for those beneficiaries sampled from Montgomery County during the post-period
and 0 for those meeting neither criteria. The coefficient of this variable measured the difference
between the waiver and non-waiver county in the change in the outcome measure over
time-that is, the difference in differences. Entered as such, it measured the net overall impact
of the waiver program on the population included in the regression. The list of covariates used in
the model is provided in Table 3-6.

Table 3-6. Independent Variables for the Regression Analyses

Demographic variables:

- age,
- gender, and
- race/ethnicity (white, African American, and other).

Medicaid enrollment variables:

- number of months enrolled during the year,
- continuously enrolled in Medicaid or enrolled with intervening gaps of one month or more,
- residence in waiver or non-waiver county, and
- enrollment year (5/88-4/89 and FY93)

Program variables:

- interaction between the FY93 year indicator and the indicator for residence in Montgomery County; and
- HMO participation (full, delayed, disenrolled, and not participating).

4.3.2 Participation-Level Effect Model

To determine the differential impact on beneficiaries in Montgomery County by the level
of their HMO participation-delayed, continuously enrolled, disenrolled, and never
enrolled-we revised the analytic model to be:

$$Y_{it} = f(\alpha' + \gamma_T T_t + \gamma_E E_{it} + \gamma_{TE} TE_{it} + \gamma_{LTE} LTE_{it} + \gamma_{DTE} DTE_{it} + \gamma_{NTE} NTE_{it} + \gamma_X X_{it} + \epsilon'_{it})$$

where LTE indicates a Montgomery County ADC recipient whose enrollment in an HMO in FY93 was delayed;

DTE indicates a Montgomery County ADC recipient who disenrolled from an HMO in FY93; and

NTE indicates a Montgomery County ADC recipient who did not enroll in an HMO in FY93.

Thus, the participation level effect model contained three additional interaction variables. The regression coefficient γ_{TE} represented the program effect on beneficiaries with continuous enrollment. By summing the regression coefficients γ_{TE} and γ_{LTE}, we derived the program effect. on beneficiaries with delayed participation in HMOs. Similarly, the sum of γ_{TE} and γ_{DTE} yielded the program effect on HMO disenrollees and the sum of γ_{TE} and γ_{NTE} gave the program effect on nonparticipating ADC recipients in Montgomery County in FY93. The statistical significance of the sums of coefficients—the participation-level effects-were tested jointly and are presented in the study findings section. In the logit analyses, for the partially enrolled or never enrolled groups, the product of odds ratios corresponding to the regression coefficients constitutes the participation level effect.

4.3.3 Racial Differences Model

To assess the differential impact of mandatory HMO enrollment on African-American and white beneficiaries, we used a similar "difference-in-difference-in-difference" framework:

$$Y_{it} = f(\alpha'' + \gamma_T T_{it} + \gamma_E E_{it} + \gamma_{TE} TE_{it} + \gamma_B B_{it} + \gamma_{BT} BT_{it} + \gamma_{BE} BE_{it} + \gamma_{BTE} B\dot{T}E_{it} + \beta X_{it} + \epsilon_{it}'')$$

This model includes controls for the secular trend effects of being African-American (B_{it}), living in the waiver county (E_{it}), and for general time series trends in demand (T_{it}). The second level interactions control for three sources of variations. The first controls for differences in demand among African-American beneficiaries in the waiver county relative to white beneficiaries in the waiver county (BE_{it}). The second one controls for changes in the demand for services among African-American versus white beneficiaries (BT_{it}). The last one controls for changes in demand among those in the waiver county versus those in the non-waiver county (TE_{it}). The higher level interaction term, BTE_{it}, identifies the effect of mandatory enrollment on the African-American (relative to white) waiver county beneficiaries (relative to the non-waiver county beneficiaries) after the 1993 waiver (relative to before the waiver).

4.3.4 Counterfactual Payments

We use a two-part model estimated with data from Summit County to predict the counterfactual expenditures for ADC recipients in Montgomery County during the post-period (Duan et al., 1983; Duan, 1983).[8] Three equations were used in the estimation. The first

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[8] We use Summit County as the comparison county in the earlier study on the advice of State officials and carried that comparison forward in this study. State officials would like us to note that Summit County has not been used as the basis for the Montgomery County capitation rates since 1992. They now believe that the pattern of

equation was a logit model that estimated the probability that beneficiaries had positive expenditures:

$$P_{it} = Pr \ (Expenditures, \ > 0) = f \ (X_{it} \beta_1 + \epsilon_{1it})$$

The regression coefficients retained from this equation were applied to data on Montgomery County beneficiaries in FY93 to derive the predicted probability[9] that Montgomery County beneficiaries would have had any expenditures in the post-period.

The second equation was a log-linear estimation of the amount of expenditures incurred by Summit County beneficiaries who had positive expenditures:

$$\ln \ (Expenditures_{it} \, | \, Expenditures_{it} > 0) = X_{it} \ \beta_2 \ + \ \epsilon_{2it}$$

Similarly, the regression coefficients retrieved from this equation were applied to data on Montgomery County beneficiaries in FY93 to obtain the predicted natural log amount of expenditures. We took the anti-log to get total expenditures. When doing this, it is necessary to include a retransformation factor, f, also known as the smearing factor, to get an accurate measure of total expenditures (Duan et al., 1983).[10]

The third equation calculated the predicted expenditures for Montgomery County beneficiaries by multiplying the predicted probability of having positive expenditures among Montgomery County beneficiaries in FY93, the retransformation factor, and the exponential form of the predicted log expenditures for Montgomery County beneficiaries in FY93:

$$E \ (Expenditures_{MC93} \, | \, X_{MC93}) = P_{MC93} * f * \exp [\ \ln (X_{MC93} \ \hat{\beta}_2]$$

We compared the predicted total Medicaid expenditures obtained from equation (3) with the actual total expenditures made by the Ohio Medicaid program for the study sample of ADC recipients in Montgomery County during FY93. The amount of the actual total expenditures includes both the capitation fees Medicaid paid the HMOs and the amount of FFS payments recorded in the MMIS for these beneficiaries.

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health care utilization and expenditures in that county are too different from those in Montgomery County.

[9] The probability of any expenditures incurred by Montgomery beneficiaries was calculated as $\exp(X\beta)/[1+\exp(X\beta)]$. It takes a value between 0 and 1.

[10] $f = \exp(\sigma^2_\epsilon/2)$, where σ^2 is the variance of the error term from the second equation.

4.3.5 Weighted Analysis

Weighted analysis was necessary to account for the stratified sample; the selection probability varied across sample strata. To approximate the effects at the population level in the two counties, weighted analyses were used in all **logit** and log-linear regression models (**Stata,** 1995). The weights were set to equal the inverse of the probability of the person being sampled.

5.   Empirical Findings

Empirical findings are presented in this section according to Montgomery County's waiver program's success in achieving four goals: (1) improving access to primary health care; (2) promoting the use of preventive services; (3) changing patterns of health services use; and (4) controlling health services expenditures. For each goal, we first display the descriptive statistics of the measures of interest. Then, we present the results of the regression analysis in two consecutive parts: the county-level program effects and the effects by HMO participation level. The full set of regression coefficients are provided in Appendix D.

5.1   Improving Access to Care

As stated above, we investigated access to care in Ohio's 1915(b) program with measures of beneficiaries' use of ambulatory care, focusing on both the levels and the settings of care, visits to hospital **ERs,** and the incidence of hospitalizations for **ACSCs.** We describe the findings below.

51.1   Total Ambulatory Care Days

The percentages of ADC recipients with at least one ambulatory care day and the number of days per beneficiary with at least one day are presented in Table 3-7. As shown in the last column of the table, the "differences in differences" between the two counties in the percentages of beneficiaries with any ambulatory days of care were rather large. Specifically, while the percentage of recipients with at least one ambulatory care day decreased from the pre-period to the post-period in both counties (except among children in the non-waiver county), it decreased more in Montgomery County than in Summit County. Among children, there was a 3.3 percentage point increase in the percentage of beneficiaries with at least one ambulatory care day in Summit County whereas a 1.5 percentage point reduction was experienced in Montgomery County.

The number of ambulatory care days per beneficiary with at least one such day increased in both counties for adults and children. Montgomery County adult beneficiaries had a lower use level than Summit County adults in the pre-waiver period. The use levels were similar in the post-waiver period between adult beneficiaries in the two counties. Hence, the rate of increase in ambulatory care days among adult users was higher in Montgomery County than in Summit County. As for the children, Montgomery County had a lower average number of days of care per user of ambulatory care in the pre-period than did Summit County. The rate of increase was

Table 3-7. Percentage of ADC Recipients with at Least One Ambulatory Day of Care and the Number of Ambulatory Days of Care per Beneficiary with Ambulatory Care by Age Group, Montgomery County and Summit County, Ohio, 5/88-4/89 and FY93

	Montgomery County		Summit County		Difference in Differences
	5/88-4/89	FY93	5/88-4/89	FY93	
Percent of Beneficiaries with Ambulatory Care Days					
Adult	71.9	67.1	74.1	73.8	-4.5
Child	67.0	65.5	73.0	76.3	-4.8
Number of Ambulatory Care Days Per Beneficiary with Events					
Adult	5.7	7.3	6.0	7.2	0.4
Child	4.0	4.5	5.0	5.4	0.1

similar between the two counties over time as shown by the small difference in differences (Table 3-7).

The multivariate analysis revealed no significant program effect in the percentages of adults or children with ambulatory care days or in the number of ambulatory days of care among adults and children who had at least one such day. Three significant participation-level effects were found (Table 3-8). First, the delayed adult participants were more likely to have had an ambulatory care day than adult FFS enrollees. Second, among beneficiaries with ambulatory care, delayed adult participants had more days of care compared to adult FFS enrollees. These beneficiaries may have been sicker on average, with a substantial number of them enrolling in Medicaid during a hospital episode. (Recall that hospitalized patients may delay their enrollment in an HMO until after discharge.) Third, Montgomery County children never enrolled in an HMO in FY93 were less likely to have had any ambulatory care compared to FFS enrollees.

5.1.2 Distribution of Ambulatory Visits by Setting of Care

The distributions of ambulatory care days over the settings of care are shown in Table 3-9 by county and year. The settings include physician offices, hospital outpatient departments (OPDs), ERs, other settings, and settings unknown because of ambiguous coding. The percentage of adults visiting physician offices increased only slightly over time while the percentage of children visiting physician offices increased by 43 percent 'in Montgomery County (from 34.2 percent to 5 1.1 percent). In Summit County, the percentages of adults and children visiting physician offices declined over time. The increase in visits to physician offices in Montgomery County is most likely attributable to the waiver program, i.e., mandatory enrollment in IPA-model HMOs with networks of office-based physicians.

Table 3-8. Multivariate Results for the Differences in the Probability
and Number of Ambulatory Care Days in Montgomery County
and Summit County, Ohio, from **5/88-4/89** to FY93

	Probability of Ambulatory Care (Odds Ratio)		Number of Ambulatory Care Days (Coefficients)	
	Adult	Child	Adult	Child
County-level program effect	1.050	.866	.018	-.024
Participant-level effects				
Delayed participation	1.484**	1.063	.148**	-.043
Full participation	1.002	.895	-.009	-.007
Disenrolled during year	1.094	.936	-.010	-.062
Nonparticipant	.770	.450**	-.059	.056

* p<.05, ** p<.01

Table 3-9. Percentage Distribution of Ambulatory Care Days by Setting of Care,
Montgomery County and Summit County, Ohio, **5/88-4/89** and FY93

	Montgomery County		Summit County		Difference in Differences
	5/88-4/89	FY93	5/88-4/89	FY93	
Office					
Adult	37.8	39.8	46.2	34.9	13.3
Child	34.2	51.1	45.7	43.0	19.6
Outpatient Department					
Adult	29.4	36.4	27.5	37.9	-3.4
Child	26.6	20.2	26.7	23.6	-1.3
Emergency Room					
Adult	17.2	14.3	17.6	17.0	-2.3
Child	26.6	20.8	25.4	20.7	-1.1
Other Setting					
Adult	12.1	6.2	4.2	7.8	-9.5
Child	11.5	6.8	1.6	11.8	-14.9
Unknown Setting					
Adult	3.6	3.3	4.5	2.4	1.8
Child	1.0	1.0	1.1	0.9	0.2

The percentage of ambulatory care delivered in hospital **OPDs** increased by 26 percent among Montgomery County adults and by 48 percent among Summit County adults. This phenomenon may be the result of the decline in inpatient use caused by a shift in the site of care from inpatient to outpatient settings. A slight decline occurred in the percentage of ambulatory care made in hospital **OPDs** among children in both counties.

Various degrees of declines were found in the percentages of ambulatory care use delivered in the ER to adults and children in both counties, with the largest drop occurring among children in Montgomery County. Virtually all **HMOs** seek to reduce the use of **ERs** for non-urgent cases. For example, the HMO with the largest Medicaid enrollment had extended contracts with after-hour urgent care centers around Dayton to reduce non-critical visits to **ERs** during after-hours. The findings suggest that mandatory enrollment in **HMOs** may have been successful in curbing ER use. However, if an enrollee visited an ER that was not part of the HMO's network and/or the ER claim was denied, the findings presented here would represent true Medicaid costs but would undercount true service use.

Finally, there was a large increase in the percentage of ambulatory care delivered in "other settings" in Summit County over time. It is plausible that there might have been a new free-standing clinic causing visits to increase in this category.

5.1.3 Emergency Room Use

We took a closer look specifically at visits to the ER (Table 3-10). As mentioned above, a major goal of managed care is to reduce unnecessary use of the ER. Smaller percentages of children and adults in ADC families had at least one visit to the ER in Montgomery County during the post-period compared to the pre-period whereas the percentages of ADC recipients with ER visits increased in Summit County over the study period. As for the numbers of ER visits, for both adults and children in Montgomery County, they remained virtually the same over the study period but increased slightly among adults and children in Summit County."

In the multivariate analysis, we found no significant county-level program effects on the probability of any ER use among ADC recipients in the waiver county (Table 3-l 1). As for the participation-level effects, adults and children who were never enrolled in an HMO in Montgomery County in FY93 were significantly less likely to use the ER compared to other FFS enrollees. Among the users of **ERs,** mandatory HMO enrollment had no effect on the number of ER visits made by adults or children.

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[11] Note that the percentage of ambulatory visits made in ER settings declined slightly in Summit County but the percentage of beneficiaries with ER visits and the number of days of ambulatory care delivered in the ER increased in the county. These results are consistent with an overall increase in ambulatory days of care which grew at a higher rate in **nonER** compared to ER settings.

**Table 3-10. Percentage of ADC Recipients with Emergency Room (ER) Visits
and the Number of Ambulatory Care Days with ER Visits per Beneficiary with Visits,
Montgomery County and Summit County, Ohio, 5/88-4/89 and FY93**

	Montgomery County		Summit County		Difference in Differences
	5/88-4/89	FY93	5/88-4/89	FY93	
Percentage of Beneficiaries with ER Visits					
Adult	35.2	34.0	38.3	41.8	-4.7
Child	37.1	35.0	39.6	41.0	-3.5
Number of Ambulatory Care Days with ER Visits					
Adult	2.0	2.0	2.0	2.2	-0.2
Child	1.9	1.8	2.0	2.1	-0.2

5.1.4   Hospitalization for Ambulatory Care Sensitive Conditions

As mentioned above, effective management of ACSCs can prevent them from advancing to more severe forms which would require inpatient care. One health plan under Ohio's 1915(b) waiver used case workers to recognize hospitalizations for ACSCs and then followed up by sending the case worker out to identify factors that could have been changed to prevent the hospitalization. Unfortunately, we had only FY93 cross-sectional data on hospitalizations for ACSCs, and therefore, we cannot definitely say whether these efforts were effective.

**Table 3-11. Multivariate Results for the Differences in the Probability
of Any Emergency Room (ER) Visits and the Number of Ambulatory Care Days
with ER Visits per Beneficiary with Visits in Montgomery County and
Summit County, Ohio, from 5/88-4/89 to FY93**

	Probability of Any ER Visits (Odds Ratio)		Number of Ambulatory Care Days with ER Visits/User (Coefficients)	
	Adult	Child	Adult	Child
County-level program effect	.927	.970	-.032	-.002
Participant-level effects				
Delayed participation	.959	.932	-.048	-.026
Full participation	.914	.971	-.040	-.014
Disenrolled during year	1.044	1.143	-.005	.050
Nonparticipant	.669*	.597**	-.015	-.042

* $p < .05$,   ** $p < .01$

Nevertheless, the data are suggestive. Table 3-12 shows that Montgomery County had lower percentages of adults and children who had at least one hospitalization for an ACSC than did Summit County. However, the two counties show *similar* numbers of admissions for ACSCs among those with inpatient services for ACSCs. If we examine the percentages of hospitalizations in the two counties that were for ACSCs, Montgomery County again had the lower rates. Due to the small sample size of hospitalizations for ACSCs, multivariate analysis was not possible.

5.2   Promoting Preventive Care

To assess Montgomery County's success in promoting preventive care, we investigated the extent to which the health plans in Montgomery County and providers in Summit County administered annual pap smears to non-pregnant women 19-39 years of age, and we compared well-child visits and childhood immunizations against national standards of care. Unfortunately, data from the pre-period were not available; therefore, only cross-county comparisons for FY93 were made.

Table 3-12. Percentage of ADC Recipients with Hospitalization of Ambulatory Care Sensitive Conditions (ACSCs), the Number of Admissions for ACSCs, and the Percentage of Admissions for ACSCs in Montgomery County and Summit County, FY93

	Montgomery County		Summit County		Difference
	5/88-4/89	FY93	5/88-4/89	FY93	
Percentage of Beneficiaries with ACS Hospital Events					
Adult	†	1.0	†	1.7	-0.7
Child	†	1.0	†	2.1	-1.1
Number of Admissions for ACSCs					
Adult	†	1.3	†	1.2	0.1
Child	†	1.2	†	1.2	0.0
Percentage of Admissions for ACSCs					
Adult	†	8.5	†	11.4	-2.9
Child	†	16.9	†	20.9	-4.0

† Data are not available.

As shown in Table 3-13, the probability of having a pap smear among women 19-39 years of age was slightly higher in Montgomery County than in Summit County in FY93—36.3 percent versus 35 percent. However, more children in Summit County had the recommended number of well-child visits, as well as a higher compliance rate for immunizations, compared to Montgomery County children. It is important to note here that because well-child (EPSDT) visits and immunizations are capitated services, PCPs have little incentive to submit specific

encounter data on them to the plans. Therefore, there may be a considerable amount of under-reporting of these services in the encounter data.

The multivariate analysis results are displayed in Table 3-14. At the county level, mandatory HMO enrollment increased the probability that women in Montgomery County received a pap smear. For children aged two months to five years of age, no county-level program effect on compliance with the well-child visit schedule was found. Lastly, no significant county-level program effect was found regarding immunization compliance.

Several participation-level effects were found for these measures. Delayed and full-period participants were more likely to have had a pap smear. With respect to well-child visits, among children aged two months to two years, those disenrolled and those never enrolled were less likely to have had the recommended number of well-child visits. As for the three-to-five-year olds, those never enrolled in an HMO in Montgomery County in FY93 were much less likely to have had the recommended number of well-child visits. Similar patterns were found for immunization compliance. The delayed enrollees were more likely whereas the disenrolled and the never enrolled were less likely to have received immunizations at the age intervals recommended by the AAP, but none of the coefficients were statistically significant.

**Table 3-13. Preventive Care Measures for ADC Recipients
in Montgomery County and Summit County, Ohio, FY93**

	Montgomery County		Summit County		Difference
	5/88-4/89	FY93	5/88-4/89	FY93	
Percentage of Women Aged 19-39 Years with Pap Smears	†	36.3	†	35.0	2.0
Well-child Visit Compliance Rates for Children Aged 2 Months-5 Years					
2 months-5 years	†	23.8	†	28.9	-5.1
2 months-2 years	†	19.2	†	24.3	-5.1
3-5 years	†	28.6	†	35.8	-7.2
Immunization Compliance Rates for Children Aged 2-30 Months					
DTP	†	47.8	†	61.5	-13.7
OPV	†	**46.5**	†	**56.0**	**-9.5**
MMR	†	**33.2**	†	**46.3**	**-13.1**
Combined	†	**45.2**	†	57.1	-11.9

† Data are not available.

Table 3-14. Odds Ratios for the Differences in the Probability of Selected Preventive Care Services in Montgomery County and Summit County, Ohio, FY93

	Annual Pap Smear Women 19-39 Years	Well-child Visit 2 mos.- 2 years	Well-child Visit 3-5 years	Combined Immunization Compliance 2-30 Months
County-level program effect	1.279*	.817	1.018	.952
Participant-level effects				
Delayed participation	1.855**	1.085	1.468	1.357
Full participation	1.249*	1.137	1.081	.944
Disenrolled during year	1.177	.368**	1.003	.722
Nonparticipant	.802	.343**	.181**	.634

* $p<.05$, ** $p<.01$

5.3 Monitoring Patterns of Health Services Use

Above, we reported the impact of the waiver program on ambulatory care days, ER use, and hospitalizations for ACSCs. To further evaluate the success of mandatory HMO enrollment on patterns of health services use, we investigated the use of physician services; medical, surgical, and delivery-related hospital care; and ambulatory laboratory and radiology services.

5.3.1 Physician Services

The percentage of adults and children with at least one physician visit declined in Montgomery County over the study period, whereas it increased for both age groups in Summit County (Table 3-15). In addition, Summit County had higher levels of physician service use in both the pre-waiver and post-waiver periods compared to Montgomery County. The difference in differences for the percentage of beneficiaries with any physician services was 2.0 percentage points higher for children than for adults. At the same time, the number of ambulatory days of physician care per user increased in both counties for both adults and children. The increase was larger for adults but smaller for children in Montgomery County than in Summit County.

As shown in Table 3-16, the multivariate analysis suggests that the mandatory HMO enrollment significantly decreased the likelihood that children in Montgomery County saw a physician in FY93. No other county-level program effect was statistically significant. With respect to the program effect by different participation levels, similar results as those found for ambulatory care days were noted for physician services: adults who delayed their enrollment in HMOs were more likely to have had a physician visit and they also had more days of care with physician services. Furthermore, children with continuous and delayed enrollment and children never enrolled were less likely to see a physician.

**Table 3-15. Percentage of ADC Recipients with Ambulatory Physician Services
and the Number of Ambulatory Care Days with Physician Services
per Beneficiary with Physician Services by Age Group,
Montgomery County and Summit County, Ohio, 5/88-4/89 and FY93**

	Montgomery County		Summit County		Difference
	5/88-4/89	FY93	5/88-4/89	FY93	in Differences
Percentage of Beneficiaries with Ambulatory Physician Services					
Adult	67.7	63.0	71.6	71.9	-5.0
Child	64.9	61.3	71.6	75.0	-7.0
Number of Ambulatory Care Days with Physician Services					
Adult	4.6	5.9	4.7	5.8	0.2
Child	3.6	3.9	4.2	4.8	-0.3

**Table 3-16. Multivariate Results for the Differences in the Probability of
Physician Services and Number of Ambulatory Care Days with Physician Services
in Montgomery County and Summit County, Ohio, from 5/88-4/89 to FY93**

	Probability of Any Physician Services (Odds Ratio)		Number of Days with Physician Services (Coefficients)	
	Adult	Child	Adult	Child
County-level program effect	1.013	.765*	.037	-.028
Participant-level effects				
Delayed participation	1.484**	.979*	.138*	-.044
Full participation	.892	.766*	.014	-.021
Disenrolled during year	1.106	.773	.019	-.050
Nonparticipant	.829	.457**	-.030	.074

* p<.05, ** p<.01

53.2 Hospital Use

Several indicators were used to examine hospital care use. These measures fall under two general categories: (1) total inpatient care use, and (2) hospital admissions by type. Total inpatient care use was examined by the probability of admission and the total number of inpatient days among users. The number of admissions by type was investigated separately for delivery-related inpatient stays, surgery stays, and medical stays.

Total Inpatient Cure Use. Table 3- 17 presents the percentage of Medicaid beneficiaries who had at least one admission to the hospital by county and year. A sharp decline occurred from the pre-period to the post-period for both adults and children in Montgomery County. There was also a slight drop in the percentage of adults with hospital care in Summit County from the pre- to post-period. However, hospital use among children in Summit County increased slightly. Montgomery County had higher levels of use in the pre-period but lower levels of use in the post-period compared to Summit County for both adults and children.

Both adults and children in Montgomery County also experienced rather large declines in bed days per beneficiary whereas a small decline in this measure was seen for adults and a slight increase was evidenced for children in Summit County. Lastly, the average number of hospital days per hospitalized beneficiary was examined for both counties. No marked change was noted over time or across the counties for adult beneficiaries; the difference in differences was less than one day of inpatient care. However, the average number of inpatient days per hospitalized child increased slightly in Montgomery County but declined slightly in Summit County over the study period. As a result, the difference in differences was greater than a day of inpatient care.

Table 3-17. Percentage of ADC Recipients with Hospital Admissions, the Number of Hospital Days per 1,000 ADC Recipients, and the Average Number of Hospital Days per Beneficiary with Hospital Admissions by Age Group, Montgomery County and Summit County, Ohio, 5/88-4/89 and FY93

	Montgomery County		Summit County		Difference in Differences
	5/88-4/89	FY93	5/88-4/89	FY93	
Percentage of Beneficiaries with Hospital Admissions					
Adult	18.5	12.7	15.2	14.2	-4.8
Child	11.8	5.8	8.8	10.3	-7.5
Number of Hospital Days per Thousand Beneficiaries					
Adult	920	619	874	806	-233
Child	656	552	456	515	-163
Average Hospital Days Per Hospitalized Beneficiary					
Adult	4.9	4.6	5.8	5.9	-0.4
Child	5.5	6.1	5.7	5.1	1.2

In the multivariate analysis at the county level, mandatory enrollment in HMOs lowered the probability of hospitalization for both adults and children (Table 3-18). The odds ratio for adults was 0.7, and for children, it was 0.6. Both figures were statistically significant. These results show that mandatory enrollment was effective in curbing hospital service use. No significant program effect was found in the analysis of total inpatient days among beneficiaries with at least one inpatient stay.

Significant participation-level effects were found only for the probability of admission. Montgomery County adults who delayed their enrollment in HMOs and those who never enrolled in an HMO in FY93 were more likely to have had an inpatient stay. Full participants and those who discontinued their enrollments were less likely to be admitted to a hospital. All children were less likely to be admitted to the hospital but those with full-participation and those never enrolled in an HMO in Montgomery County in FY93 were the least likely to be hospitalized.

Hospital Admissions by Type. The volume of inpatient use among users was broken into three categories-delivery-related, surgical, and medical. Delivery-related inpatient stays were calculated for females 12 years of age and older and were defined as stays with labor, delivery (vaginal or cesarean section and various abortions), and newborn nursery services. We classified stays as surgical stays if any surgical procedures other than delivery-related surgeries or circumcisions were billed. All other stays were classified as medical stays.

Table 3-18. Multivariate Results for the Differences in the Probability of Any Hospital Admissions and the Number of Hospital Days per Hospitalized Beneficiary in Montgomery County and Summit County, Ohio, from 5/88-4/89 to FY93

	Probability of Any Hospital Admissions (Odds Ratio)		Number of Inpatient Days/User (Coefficients)	
	Adult	Child	Adult	Child
County-level program effect	.724*	.589**	-.036	.143
Participant-level effects				
Delayed participation	1.462**	.907**	-.016	.114
Full participation	.411**	.452**	-.036	.114
Disenrolled during year	.845**	.703**	-.107	.332
Nonparticipant	1.185**	.402**	.084	.036

* $p<.05$, ** $p<.01$

Table 3-19 shows that Montgomery County had a higher rate of admissions per user across all three types of inpatient stays in the pre-period and that various degrees of reductions were evident in the incidence of all three types over the study period. For example, the probability of delivery-related inpatient admissions in Montgomery County declined while an increase occurred in Summit County. This led to rather large values for the difference in differences for delivery-related admissions per user.

As for surgical admission rates, a 44 percent reduction in surgical admissions per user among adults in Montgomery County was accompanied by a 70 percent reduction in Summit County. Among children, the reduction was slightly greater in Montgomery County than in

Summit County. Similar statistics were found for medical-related admissions. Sharper reductions in Montgomery County (28 percent) than Summit County (11 percent) resulted in a fairly large difference in differences for medical-related admissions per user among adults. Among children, a 50 percent reduction in medical-related admissions per user occurred in Montgomery County while an increase occurred among Summit County children. These . reductions in admissions are consistent with the general shift of care from inpatient to outpatient departments and the overall reduction in inpatient service use in the past decade.

Log-linear OLS regressions on the number of inpatient stays per beneficiary with at least one such stay for each of the three admission types were conducted. The results are presented in Table 3-20. With respect to delivery-related inpatient stays, significantly fewer Medicaid-covered delivery-related stays occurred among adults with deliveries in Montgomery in the post-period. The decline was evidenced among all women regardless of HMO participation, but the largest drops were among those who were enrolled in HMOs for their full Medicaid enrollment period and those who disenrolled from HMOs during the year. No significant effect was found among   children.

Table 3-19. Admissions per 1,000 ADC Recipients by Type of Admission,
Montgomery County and Summit County, 5/88-4/89 and FY93

	Montgomery County		Summit County		Difference in Differences
	5/88-4/89	FY93	5/88-4/89	FY93	
Delivery-related					
Adult	151.4	110.2	99.3	127.2	-69.1
Child	81.4	67.7	58.7	66.1	-21.1
Surgery-related					
Adult	41.2	23.2	34.6	10.3	6.3
Child	17.3	11.1	15.5	10.1	-0.8
Medical-related					
Adult	47.8	34.3	38.2	33.9	-9.2
Child	52.8	26.3	30.0	43.8	-40.3

Table 3-20. Multivariate Results for the Differences in the Number of Hospital Stays per Hospitalized Beneficiary by Type of Admission in Montgomery County and Summit County, Ohio, from 5/88-4/89 to FY93

	Delivery-Related		Surgery		Medical	
	Adult	Child	Adult	Child	Adult	Child
County-level program effect	-.111**	.010	-.070	-.020	.033	-.054
Participant-level effects						
Delayed participation	-.062**	t	-.057	.160	.154	-.141*
Full participation	-.169**	t	-.020	-.051	-.071	-.207*
Disenrolled during year	-.135**	t	-.138*	-.124	-.014	.161**
Nonparticipant	-.039**	t	-.196	.244	.421**	.180*

*p<.05, **p<.01 ; t sample size too small to produce meaningful results

As for surgical-related stays, no county-level program effects were found among adults. The only significant participation-level effect was among adults who disenrolled from HMOs. They had fewer stays for surgeries. No program effect or participation-level effects were found among children.

No county-level program effects were found either among adults or children regarding medical-care-related inpatient stays. However, five participation-level effects were uncovered: adults and children never enrolled in HMOs and children who disenrolled had more medical stays per user, and children with continuous or delayed enrollment had fewer stays per user.

5.3.3 Laboratory and Radiology Services

The intensity of ambulatory services can be measured by calculating the proportion of all days of care in which laboratory or radiology procedures were performed. As shown in Table 3-21, the intensity of services delivered to adults was similar between the two counties in the pre-period and diverged over time, with a decline in Montgomery County and an increase in Summit County. Small increases' in service intensity were experienced in services delivered to children in both counties. At the same time, the number of laboratory and radiology services per user increased across the board, except for children in Summit County.

Table 3-21. Percentage of ADC Recipients with Laboratory or Radiology Services and the Number of Ambulatory Care Days with Laboratory or Radiology Services per Beneficiary with These Services, Montgomery County and Summit County, Ohio, 5/88-4/89 and FY93

	Montgomery County		Summit County		Difference in Differences
	5/88-4/89	FY93	5/88-4/89	FY93	
Percentage of Beneficiaries with Lab or Xray Services					
Adult	58.0	56.3	58.0	60.2	-3.9
Child	41.6	44.3	44.3	44.7	2.3
Number of Days with Lab or Xray Services per Beneficiary with These Services					
Adult	3.3	4.1	3.2	4.3	-0.3
Child	1.8	2.1	2.0	1.9	0.4

The multivariate analysis revealed that mandatory HMO enrollment did not affect the likelihood that children received a laboratory or radiology test but increased the number of these services per child user (Table 3-22). Adults and children with delayed enrollment in HMOs and children with any HMO enrollment were more likely to have had these services. On the other hand, children never enrolled in HMOs were less likely to have had them. Among the users, adults with delayed enrollment and children continuously enrolled or never enrolled used more ancillary services.

Table 3-22. Multivariate Results for the Differences in the Probability of Any Laboratory or Radiology Services and the Number of Ambulatory Care Days with Laboratory and Radiology Services per Beneficiary with Services in Montgomery County and Summit County, Ohio, from 5/88-4/89 to FY93

	Probability of Any Lab or Xray Services (Odds Ratio)		Number of Ambulatory Care Days with Lab or Xray Services User (Coefficients)	
	Adult	Child	Adult	Child
County-level program effect	1.037	1.179	-.050	.096*
Participant-level effects				
Delayed participation	1.428**	1.027**	.101**	.090
Full participation	.946	1.352**	-.079	.105*
Disenrolled during year	1.096	1.132*	-.106	.055
Nonparticipant	.832	.726**	-.089	.240**

* p<.05, ** p<.01

5.4   Controlling Health Services Expenditures

In addition to improved access or quality, policymakers are looking for cost control under managed care. Therefore, we looked at different measures of expenditures (cost from the viewpoint of HCFA) in an attempt to determine if any savings accrued as a result of mandatory HMO enrollment in Montgomery County.

We first compared average total actual expenditures in Summit and Montgomery Counties; savings may have accrued if total program payments in Montgomery County were less than total payments in Summit County, ceteris paribus. Unfortunately, because we did not have information on capitation payments for the Medicaid beneficiaries enrolled in HMOs in the pre year, we could compare only post-year differences.

Another indicator of potential savings was obtained by comparing counterfactual costs with actual total Medicaid expenditures in Montgomery County. Conceptually, counter-factual costs are those costs which the Medicaid program would have incurred had all Medicaid beneficiaries in Montgomery County remained under FFS Medicaid. If the counter-factual payment is greater than the actual total Medicaid expenditure for Montgomery County then we may say that there were savings due to HMO enrollment.

Readers should keep in mind that HMOs in Montgomery County lack incentives to accurately report utilization. We have obtained their encounter data, but because they do not pay FFS for each encounter, there is the possibility that certain encounters are not reported. In our previous Medicaid Competition Demonstration Evaluation, we estimated underreporting to be about 15 percent (RTI, 1989).

5.4.1 Total Medicaid Payment

We first compare the average total Medicaid payment amounts in Montgomery and Summit Counties. Average total payments made in Montgomery is the sum of the FFS payments and the capitation payments made to HMOs whereas, in Summit County, it is the same as the average total FFS payment. As shown in Table 3-23, average total payments for an adult in Montgomery County was $1,226, and it was $1,106 for a child. In Summit County, total Medicaid payments were lower-$1,038 for an adult and $754 for a child. The differences in payments were statistically significant. Therefore, based on this measure, no savings from the 1915(b) program were observed.

The data in Table 3-23 also shows that there still were substantial FFS payments in Montgomery County in FY93 for ADC recipients. About 19 percent of total Medicaid expenditures for adults were FFS payments, and 13 percent of Medicaid expenditures for children were FFS payments. The average Medicaid FFS payments made for ADC recipients in Montgomery County during the post-period was $378 per adult and $177 per child; the average total capitation payments per beneficiary in Montgomery County was $849 for adults and $929 for children.

**Table 3-23. Average Total Medicaid Payments for ADC Recipients,
Montgomery County and Summit County, Ohio, FY93**

	Montgomery County	Summit County	Difference
Total Medicaid Payment per person			
Adult	$1,226	$1,038	**$188****
Child	$1,106	$754	**$352****
Total FFS Payment per person			
Adult	$378	$1,038	**n.a.**
Child	$177	$754	n.a.
Capitation Payment			
Adult	$849	0	n.a.
Child	$929	0	n.a.

** p<.01; n.a. - not applicable.

5.4.2 Counterfactual Total Medicaid Payments

Actual total Medicaid expenditures in Montgomery County are compared with counter-factual FFS costs in Table 3-24. The method for estimating counterfactual costs can be found in section 4.3.4. The analysis indicates that counterfactual costs are lower than actual total expenditures in Montgomery County for both adults and children. The counterfactual FFS expenditure was estimated as $1,076 per adult, which is 12 percent below the average actual total Medicaid expenditure per adult, and as $766 per child, which is 30 percent below the actual total expenditure per child. Hence, this comparison indicates no savings accrued from HMO enrollment for either adults or children.'*

**Table 3-24. Actual and Counterfactual Total Medicaid Payments
for Montgomery County, Ohio, FY93**

	Adults	Children
Actual	$1,226	$1,106
Counterfactual	$1,076	**$766**

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[12] We also compared the actual and predicted expenditures in Summit County to measure the reliability of the two-part prediction model. The predicted expenditures are 12 percent higher than actual for adults and 8 percent lower for children.

Because we were not able with the claims data to control for potential differences between the counties in health status and other factors that may influence health service use and expenditures besides basic demographic and Medicaid enrollment characteristics, we cannot be sure whether parameters estimated on Summit County data accurately represent the true model for Montgomery County residents. The State stopped using Summit County as the basis for estimating capitation rates for Montgomery County in 1993 because they believed that patterns of utilization and expenditures were too different.

5.4.3   FFS **Payments by HMO Participation**

Since the amount of FFS payments in Montgomery were large in the post period, we investigated how such FFS payments might vary by participation level (Table 3-25). Intuition would suggest that those Medicaid beneficiaries who were continuously enrolled and those who disenrolled would have lower FFS expenditures than those whose enrollment was delayed or who never enrolled and stayed only in F'FS. The data in Table 3-25 confirm this.

Table 3-25. FFS Payments by HMO Participation in Montgomery County, Ohio, FY93

	HMO Enrollment Participation Level			
	Never	Delayed	Continuous	Disenrolled
FFS Payment per person				
Adult	$796	$625	$86	$296
Child	$363	$413	$24	$162
Percent of Total Medicaid Payment that was FFS				
Adult	100	18	2	10
Child	100	13	1	5

Similarly, we also computed the percentage of total payments for each group that was FFS rather than capitation. Continuously enrolled beneficiaries in Montgomery County had only 1-2 percent of their total expenditures from FFS payment; these figures, however, were almost 10 times as high for beneficiaries whose enrollment was delayed. This suggests that diligence in quickly getting Medicaid beneficiaries into managed care may be a good cost-saving strategy.

5.5   **Impact on Minority Beneficiaries**

Table 3-26 displays the descriptive statistics for selected service use measures separately for African-American and white adult and child beneficiaries. These data show that the program had a negative impact on the probability of ambulatory care use and that the negative impact was greater for African-American adults than white adults, and was even larger for African-American children, whereas white children experienced a slight positive effect.

Table 3-26. Selected Service Use Measures for ADC Recipients by Race,
Montgomery County and Summit Counts, Ohio. 5/88-4/89 and FY93

	Montgomery		Summit		Difference in
	Pre (FY89)	Post (FY93)	Pre (FY89)	Post (FY93)	Difference
Percentage of beneficiaries with ambulatory care					
Adult: African-American	67.6	64.4	71.4	72.9	4.7
White	69.9	65.1	72.1	69.2	1.9
Child: African-American	62.8	63.2	67.9	77.4	9.1
White	69.3	67.3	75.9	73.1	-0.8
Number of ambulatory days of care					
Adult: African-American	4.6	5.6	5.1	6.4	0.3
White	5.6	7.6	5.9	6.7	-1.2
Child: African-American	3.4	3.7	4.1	5.0	0.6
White	4.3	5.3	5.1	5.7	-0.4
Percentage of beneficiaries with outpatient physician care					
Adult: African-American	63.9	59.4	69.4	71.2	6.3
White	65.8	61.4	69.4	67.0	2.0
Child: African-American	60.9	58.3	66.5	75.5	11.6
White	67.2	63.8	74.5	72.2	1.1
Number of ambulatory care days with physician care					
Adult: African-American	3.9	4.5	4.3	5.2	0.3
White	4.7	6.0	4.8	5.4	-0.7
Child: African-American	3.0	3.1	3.5	4.4	0.8
White	3.9	**4.5**	**4.6**	**5.0**	**-0.2**
Percentage of beneficiaries with inpatient admissions					
Adult: African-American	6.1	3.6	5.6	5.2	2.1
White	7.1	4.9	6.9	3.5	-1.2
Child: African-American	3.9	1.8	3.5	3.4	2.0
White	4.2	2.2	3.2	3.9	2.7
Number of inpatient days					
Adult: African-American	6.8	6.7	9.3	6.3	-2.9
White	8.2	7.7	7.5	6.2	-0.8
Child: African-American	5.6	4.2	3.6	4.9	2.7
White	**7.4**	**8.0**	**3.6**	**2.0**	**-2.2**
Percentage of beneficiaries with surgical admissions					
Adult: African-American	3.2	1.8	2.6	1.5	0.3
White	5.2	2.7	4.0	0.9	-0.6
Child: African-American	1.6	0.5	0.9	1.1	1.3
White	1.2	0.9	1.1	0.9	0.1
Percentage of beneficiaries with medical admissions					
Child: Adult: White African-American African-American	4.1 4.9 3.9	2.7 3.6 1.7	4.5 2.2 3.4	4.9 3.0 2.9	0.9 2.9 1.8
white	4.3	1.9	3.0	3.0	2.4
Percentage of beneficiaries with ER visits					
Adult: African-American	34.3	35.4	39.7	44.7	3.9
White	33.9	30.5	33.8	36.7	6.3
Child: African-American	34.3	35.4	38.5	44.2	4.6
White	38.3	33.7	39.2	37.9	3.3

For all service use measures studied, except the number of inpatient days and the percentage of beneficiaries with any ER visits, African-American adults in Montgomery County had a greater relative drop or smaller relative increase in service use than white adults. For children, eight of the nine measures show a larger, negative impact for African-Americans than whites. These findings suggest that the implementation of the waiver program disproportionally reduced care among African-American beneficiaries compared to whites.

We found similar results in the multivariate analyses, as shown in Table 3-27.[13] Among six types of health services examined, four of them show statistically significant racial differences in use patterns. For acute care services, compared with white beneficiaries, adult African-American beneficiaries had fewer outpatient visits and fewer visits to physicians, were less likely to be admitted to hospitals, and among those with hospital stays, had fewer surgery-related admissions. African-American children were less likely to have used any ambulatory care and to have seen a physician. They also had fewer inpatient admissions and fewer surgery-related admissions.

6. Summary of Empirical Findings

6.1 Enrollment

Although enrollment in HMOs was mandatory in the post-waiver period in Montgomery County, not all eligible Medicaid beneficiaries were enrollees in an HMO during the post-waiver period. Twenty-six percent of adults and 21 percent of children never enrolled in an HMO. Among those who enrolled in the HMOs, some beneficiaries delayed enrollment, and others withdrew early. Women were more likely to be enrolled in an HMO. White beneficiaries were more likely to be enrolled in HMO A or remain in FFS Medicaid. HMO B and HMO C had more African-American beneficiaries. Those who stayed in FFS Medicaid had fewer months of eligibility for Medicaid than those enrolled in HMOs—four months versus 10 months. HMO B had the highest full participation rates among both adults and children, and the lowest rate of delayed enrollment. The disenrollment rates were similar across the three HMOs among both adults and children.

6.2 Service Use and Expenditures

Based on multivariate analyses of health services use and expenditures, we examined the impact of Montgomery County's mandatory HMO enrollment program in comparison to pre-waiver voluntary HMO enrollment in Montgomery County and the FFS Medicaid program in Summit County in both the pre- and post-waiver periods. The analyses focus on two levels of impacts: (1) the county level and (2) the participant level.

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[13] **A full set of regression results are available from the authors upon request.**

**Table 3-27. Multivariate Results of the Differential Program Impact
on African American ADC Recipients in Montgomery County
and Summit County, Ohio, from 5/88-4/89 to FY93**

Type of Service	Probability of Service Use		Level of Service Use	
	Adult	Child	Adult	Child
	Odds Ratio		Coefficients	
Ambulatory care	.832	.507**	-.272**	-.056
Physician care	.743	.506**	-.239*	-.129
All inpatient admission	.362*	.817	.483	-1.081*
Surgery admission	.508	.331	-.339*	-.304
Medicine admission	.448	.979	.108	-.192
Emergency department	1.178	1.076	-.088	-.034

*: p<.05, **: p<.01

In general, mandatory enrollment in HMOs had a greater impact on the probability of service use than on the intensity of services received by Medicaid beneficiaries. Due to the relatively short time after mandatory enrollment, the findings from this evaluation may not represent the steady state of program effects. Continued monitoring of use and program expenditures are essential to Medicaid program budgeting and planning.

6.2.1 County Level Impact

County-level impacts are summarized in Table 3-28. The existence and direction of the county-level program effect in each of the equations are reported. Statistically significant coefficients are reported with their signs: "-" for a negative effect and "+" for a positive effect. When a statistically significant effect is absent, "0" is entered in the corresponding cell in the table. We summarize the findings below.

Access to Primary Health Care. Information obtained from the site visit to Ohio indicates that more primary care physicians were willing to participate in Medicaid. Four measures of access were used to examine access to care: the probability of obtaining outpatient care, the level of outpatient service use, the probability and the number of days of care with ER visits. No significant county-level program effects were found for any of these measures.

A lower incidence of hospitalizations for ACSCs and a greater percentage of women with preventive pap smears suggest that access to care may have been better in the HMOs than under FFS Medicaid. On the other hand, ADC recipients in Montgomery and Summit Counties were equally likely to have ambulatory care days and ER visits. Furthermore, ADC preschoolers in Montgomery County in FY93 were no more likely to have received recommended well-child

Table 3-28. Summary of Impact of Mandatory HMO Enrollment in Montgomery County, Ohio, FY93

	County-Level		Continuously Enrolled Participants	
	Adults	Children	Adults	Children
Improving Access to Care				
Any ambulatory days of care	0	0	0	0
Number of ambulatory days of care	0	0	0	0
Any ER visits	0	0	0	0
Number of days of care with ER visits	0	0	0	0
Promoting Preventive Care				
Compliance with well-child visit schedule	n.a.	0	n.a.	0
Compliance with immunization schedule	n.a.	0	n.a.	0
Compliance with annual pap smears	+	n.a.	+	n.a.
Monitoring Use Pattern				
Any Physician services	0	–	0	–
Number of ambulatory days with physician services	0	0	0	0
Any hospital stays	–	–	–	–
Number of hospital days	0	0	0	0
Number of delivery-related admission	–	0	–	n.a.
Number of medical-related admission	0	0	0	–
Number of surgery-related admission	0	0	0	0
Any outpatients laboratory or radiology	0	0	0	+
Number of days with lab or x-ray services	0	+	0	+
Controlling Program Expenditures				
Comparison with Summit County	0	0	n.a.	n.a.
Comparison with counterfactual	+	+	n.a.	n.a.

0 no significant effect
+ increased use
– decreased use or expenditures

visits and childhood immunizations compared to similar children in Summit County. However, we were not able to control for health status or confounding county-specific factors in these analyses. In addition, because well-child visits and childhood immunizations were covered under the capitation payment, PCPs had little incentive to accurately report these services. As a result, they may be under-reported.

In summary, we saw no consistent evidence that access to care among ADC recipients was either favorably or adversely affected by mandatory HMO enrollment in Montgomery County as a whole.

Promoting Preventive Cure. As discussed above, mandatory enrollment was associated with higher compliance rate on annual pap smears among non-pregnant women, but no significant effects for compliance with well-child visit and childhood immunization schedules. Given that these services may be under-reported and that we only have data on preventive care from the post-waiver period (i.e., the comparison is only cross-sectional between the two counties), the results must be considered inconclusive.

Monitoring Patterns of Service Use. Mandatory enrollment in **HMOs** significantly changed the patterns of service use among Medicaid beneficiaries. Adults and children in Montgomery County during the post-waiver period were less likely to have any hospital stays. In addition, children were less likely to have ambulatory care days with physician services and they had more laboratory and radiology services.

Controlling Program Expenditures. Based on counter-factual FFS payment estimates, mandatory HMO enrollment in Montgomery County during FY93 did not save the Medicaid program any money in the short run and may have been cost increasing. Estimated counter-factual payments were 12 percent lower than actual payments for adults and 30 percent lower than actual payments for children.

6.2.2 Participation Level Impact

The results from regression analysis on the participation level impact also are summarized in Table 3-28. The significance and direction of the coefficients for the participant continuously enrolled in **HMOs** are shown.

Access to Primary Health Care and Use of Preventive Care. Montgomery County ADC recipients continuously enrolled in **HMOs,** both adults and children, had no significant advantage in access to care or use of preventive care in comparison to beneficiaries in Summit County. However, adult women were slightly more likely to have had pap smears.

Monitoring Patterns of Service Use. All adults continuously enrolled in **HMOs** were less likely to be hospitalized. Children continuously enrolled in **HMOs** were less likely to have had any hospital stays and had fewer medical-related admissions. These two impacts perhaps show the success of **HMOs** in reducing unnecessary inpatient service use. On the other hand, these children were found to be more likely to use ambulatory laboratory and radiology services, potentially showing a shift in care from inpatient to outpatient settings.

Controlling Program Expenditures. Medicaid beneficiaries who were continuously enrolled in an HMO and those who disenrolled from **HMOs** had lower **FFS** expenditures compared to beneficiaries whose enrollment was delayed or who never enrolled during the analysis year. This result is largely due to their shorter Medicaid enrollment duration.

6.3 Impact on Minority Populations

We found relatively greater declines or smaller increases in service use among **African-**American beneficiaries compared to white beneficiaries after mandatory HMO enrollment in

Montgomery County. These differences particularly in the probability of any ambulatory care and physician services among African-American children suggest an inequity in access to primary care.

We conclude that the inequity in service use between African-American and white Medicaid beneficiaries, well documented in existing literature, is prevalent again after mandatory HMO enrollment. Policy measures must be developed to eliminate racial disparity in access to care and use of services among Medicaid beneficiaries.

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Chapter 4: The Florida MediPass Program

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1. Introduction

We chose Florida for our impact analysis of the Section 1915(b) waivers because of the mix of managed care arrangements for Medicaid beneficiaries in the State. Florida has become a hotbed of managed care development. The State encourages its Medicaid beneficiaries to enroll. in health maintenance organizations (HMOs). In addition, under a Section 1915(b) waiver, the State implemented a primary care case management (PCCM) program, the Medicaid Physician Access System' (MediPass), as the default Medicaid coverage for certain beneficiaries not choosing to enroll in HMOs. These beneficiaries included Aid to Families with Dependent Children (AFDC) cash assistance recipients, other Medicaid-enrolled families with children, and pregnant women and children enrolled in Medicaid under the State Omnibus Budget Reconciliation Act (SOBRA) expansion categories.

The originai waiver, which was approved in January 1990, covered a four-county pilot area around Tampa-St. Petersburg, including Hillsborough, Manatee, Pasco, and Pinellas Counties. In 1996, the State expanded MediPass to other counties and eligibility groups.* However, this analysis is focused on the early experience of the program in the initial four-county implementation area and the original eligibility groups during the fiscal year running from July 1992 to June 1993 (FY93).

The experience of MediPass-eligible Medicaid beneficiaries in the four waiver counties in FY93 is compared to the experience of similar Medicaid beneficiaries in these counties in FY91 (prior to program implementation) and in four comparable counties in FY91 and FY93. The comparison counties-Lake, Orange, Osceola, and Seminole-comprise the four-county area around Orlando. These counties were considered the best match for the four-county Tampa/St. Petersburg area in terms of location in central Florida, size, and the inclusion of both urban and rural areas.

We used Medicaid enrollment and claims data to investigate MediPass participation and the success of the program in achieving the following four goals: (1) improving access to primary health care, (2) promoting the use of preventive care services, (3) changing patterns of service use, and (4) controlling Medicaid expenditures. Medicaid children (under 18 years of age) and adults (aged 18 years or more) were analyzed separately.

Because we were not able to obtain comparable encounter data for Medicaid beneficiaries who were enrolled in HMOs, we excluded beneficiaries with any HMO coverage during the study period from the analysis. Therefore, **the estimated program impact is the effect of implementing a mandatory PCCM program over a traditional fee-for-service (F'FS) program among Medicaid beneficiaries who declined voluntarily HMO coverage.**

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[1] In 1996, the program was renamed the Medicaid Provider Access System.

[2] Coverage of non-Medicare-eligible SSI recipients began June 1996 and coverage of children in foster care and adoption subsidy arrangements began October 1996.

In Section 2 below, we investigate HMO participation and describe the non-HMO study population. We list the research questions to be investigated and hypotheses to be tested in Section 3. In Section 4, we describe our estimation methods and list the dependent and independent variables for the analysis. Finally, we present the results of the descriptive and multivariate analyses in Section 5 and a summary and conclusions in Section 6.

2. Background

2.1 The MediPass Program

Physician recruitment in the pilot area began in July 199 1, and recipient enrollment began in October 1991. Initially, enrollment was limited to AFDC cash assistance recipients, other Medicaid-enrolled families with children (non-cash), and SOBRA expansion beneficiaries.[3] MediPass was mandatory for Medicaid beneficiaries in these eligibility categories who were not enrolled in an HMO.

Nevertheless, we found a significant number of MediPass-eligible beneficiaries in the waiver counties who were enrolled in traditional FFS Medicaid for all or part of their Medicaid enrollment period in FY93. These beneficiaries included those who were enrolled in both a MediPass eligible and a non-eligible enrollment category during the year, beneficiaries with retroactive Medicaid eligibility, and beneficiaries who had not completed the MediPass enrollment process. During the early years of the program, enrollment required face-to-face interviews conducted at area offices. The delay in getting an appointment, processing the enrollment papers, and choosing a PCP could take three to four months. If the person became ineligible for Medicaid during this period and a little while later became eligible again, the process had to begin all over again. In January 1996, the State automated the enrollment process; MediPass enrollment now takes as little as one month. However, State officials report that, during any month of the year, 15 percent of eligible beneficiaries are going through the MediPass enrollment process.

Under MediPass, participants are assigned a PCP based on geographic location, but they may request a different PCP at enrollment and may change PCPs or enroll in an HMO at any time. PCPs can be internists, family practitioners, general practice physicians, obstetricians, gynecologists, or pediatricians. Physician practices, health care clinics, and advanced registered, nurse practitioners (ARNPs) and physician assistants (PAs) working under a physician's supervision can also serve as PCPs. PCPs can limit the number of Medicaid beneficiaries they will accept under MediPass, but they cannot exceed the upper limit of 1,500 beneficiaries per physician set by the state. During the study period, ARNPs and PAs could serve as the PCP for up to 300 beneficiaries; in May 1996, this cutoff was expanded to 750 beneficiaries.

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[3] Excluded from MediPass were individuals who were aged, blind, or disabled; those who were in mental hospitals, skilled nursing facilities, or intermediate care facilities; individuals in foster care or subsidized adoption arrangements; all spend-down cases; and newly-eligible individuals who had not completed the enrollment process. As state in footnote 2, non-Medicare-eligible SSI recipients, foster care children, and children in adoption subsidy arrangements are now also required to enroll in MediPass if they do not voluntarily enroll in an HMO.

PCPs provide MediPass participants all their primary care needs and manage all their other health care needs. MediPass participants must obtain referrals from their PCP for specialty and hospital services; prior authorization is not required for family planning and medically necessary emergency services. All Medicaid-covered services are included in MediPass, except dental care, mental health, ophthalmology, optometry and eye glasses, obstetrics, nursing home and intermediate care facility services, durable medical equipment,[4] and transportation. These exempted services can be obtained through FFS Medicaid.

All providers, including PCPs, are reimbursed in MediPass on a FFS basis. In addition, PCPs receive a monthly $3.00 case management fee for each beneficiary assigned to them. The fee serves as an incentive for providers to participate in the program and helps cover any new costs for the 24-hour access, outreach to new patients, and review of the monthly MediPass utilization reports that PCPs must provide or perform under MediPass.

The Florida MediPass program was designed to improve access to quality care for Medicaid beneficiaries, thereby providing benefits to patients, providers, and taxpayers. For patients, the program provides a personal doctor and a medical home, reducing the amount of doctor shopping and increasing the continuity of care among the Medicaid beneficiaries. For providers, the program identifies a population of Medicaid patients among whom providers can build ongoing relationships, reducing the chance of duplicative diagnostic services and conflicting treatments. For taxpayers, the program reduces costs by eliminating unnecessary care and improving health through an emphasis on primary and preventive care from a single source.

To encourage preventive care use, the MediPass program covers annual screening visits for adults and Early and Periodic Screening, Diagnosis, and Treatment (EPSDT) services for beneficiaries aged from birth to 20 years. Caregivers are encouraged to bring children in for EPSDT screening visits at recommended age-intervals. MediPass child beneficiaries and their caregivers receive letters in the mail reminding them when the child's next EPSDT checkup or immunization is due and directs them to call their MediPass PCP to set up an appointment. Each month the State also sends the PCPs lists of MediPass patients assigned to them which indicate the date of the last EPSDT screening visit for each child. As the child's gatekeeper and personal physician, the PCP is responsible for making sure he or she is in compliance with the recommended EPSDT visit and childhood immunization schedule.

However, in FY93, the State's reimbursement rate for an EPSDT visit was $30 compared to $50 for a comprehensive office visit. Furthermore, the documentation required of providers for an EPSDT screening visit was greater than that for a comprehensive office visit. The State does not reimburse providers for comprehensive office visits for well-child care. However, if the child has an illness-related symptom, such as a rash or a cold, a related diagnosis code can be recorded on the bill for a comprehensive office visit to ensure reimbursement at the higher rate. Unfortunately, the State cannot count such a visit as an EPSDT visit and get credit for it in reaching the goal of 80 percent EPSDT participation among enrolled children. This target was set for all States by the Secretary of the Department of Health and Human Services in response to

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[4] Durable medical equipment became a covered service under MediPass in March 1997.

the Congressional mandate for EPSDT performance goals in the Omnibus Budget Reconciliation Act of 1989.

Currently, the reimbursement rates for EPSDT screening visits at $65.33 is still lower than the reimbursement rate for a comprehensive office visit (CPT 99205), which is $82.00. However, the Agency for Health Care Administration (AHCA) in Florida has a request in to their State legislature to make the Medicaid fees for these two services equivalent. In addition, the State now requires PCPs to make three attempts to get newly enrolled children and adults in for screening visits; has nurses in the area AHCA offices do medical record audits on a sample of enrolled children each month to look for EPSDT and immunization compliance; conducts outreach to program eligibles through radio, newspaper, and child health fairs; has added quality standards into the MediPass contract that include HEDIS targets for preventive care; and puts out a quarterly quality-of-care report based on the claims data and medical reviews. These changes have helped the State more than double the EPSDT screening rate which was 29 percent statewide in 1992 and stood at 84 percent in 1997.

2.2   The Study Population

The study population came from the universe of Medicaid beneficiaries in the four waiver and four comparison counties who were enrolled under MediPass-eligible eligibility categories in FY91 and FY93.[5] Over the study period, this population grew by 52 percent in the waiver (MediPass) counties (from 159,505 to 242,154) and by 72 percent in the comparison counties (from 90,533 to 155,619). From this population, we excluded all beneficiaries with any Medicaid HMO coverage during the year. We did this because we were not able to obtain encounter data for the beneficiaries' HMO experience.

Table 4-1 shows the penetration rate of HMOs among the MediPass-eligible Medicaid beneficiaries in the study counties during the analysis years. In the four MediPass counties, 13.2 percent of Medicaid beneficiaries in MediPass-eligible eligibility categories had at least one month of enrollment in HMOs in FY91, with HMO enrollment concentrated in Hillsborough and Pinellas Counties. The HMO penetration rate grew to 26.7 percent in the MediPass counties in FY93, with Pasco County reaching a level comparable to Hillsborough and Pinellas Counties.

HMO penetration was very low (i percent) in the comparison counties in FY91. However, by FY93, HMO penetration reached almost one third of Medicaid beneficiaries enrolled in MediPass-eligible eligibility categories in three of the four comparison counties. Lake County enrollees continued to have a low HMO penetration rate (less than 4 percent) among this group of Medicaid beneficiaries.

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[5] Beneficiaries enrolled under more than one eligibility category during the year were classified by the category under which they were enrolled for the greatest number of months.

Table 4-1. Percentage Distribution of Medicaid Beneficiaries by Participation in HMOs, the MediPass Program and Traditional FFS, Florida Waiver and Comparison Counties, FY91 and FY93

	FY91			FY93			
	Number of Beneficiaries	Percent in HMOs[1]	Percent in FFS[2]	Number of Beneficiaries	Percent in HMOs[1]	Percent in MediPass[3]	Percent in FFS[3]
MediPass Counties	159,505	13.2	86.8	242,154	26.7	44.7	28.6
Hillsborough	77,407	15.2	84.8	114,919	28.5	42.6	28.9
Manatee	14,303	0.7	99.3	22,913	2.0	66.0	32.1
Pasco	19,272	1.6	98.4	30,508	27.1	41.9	31.0
Pinellas	48,523	18.4	81.6	73,814	31.4	42.5	26.1
Comparison Counties	90,533	1.0	99.0	155,619	28.6	—	71.4
Lake	13,618	0.6	99.4	20,400	3.6	—	96.4
Orange	52,267	1.1	98.9	91,047	32.8	—	67.2
Osceola	9,583	1.2	98.8	17,600	31.3	—	68.7
Seminole	15,065	0.8	99.2	26,572	31.8	—	68.2

[1] At least one month of HMO enrollment.

[2] Enrolled in FFS for the entire year.

[3] At least one month of MediPass enrollment and no HMO enrollment during the year.

Table 4-l also shows that although MediPass was the default enrollment in FY93, 28.6 percent of MediPass-eligible Medicaid beneficiaries in the four waiver counties had no enrollment in either MediPass or HMOs during the year. Thus, a significant number of enrollees were in non-eligible eligibility categories for part of their Medicaid enrollment period and/or were waiting for PCP assignment before they changed their Medicaid eligibility status or the year ended.

2.2.1   Determinants **of HMO Enrollment**

Beneficiaries with any HMO enrollment during the analysis years were dropped from the study population because we did not have encounter data for their HMO service use. The percentage distributions of Medicaid beneficiaries over selected demographic and Medicaid enrollment characteristics are shown in Tables 4-2a and 4-2b, respectively, for HMO enrollees and the study population (MediPass and FFS enrollees). These data show that, compared to the study population, HMO enrollees were more likely to be African-American, cash assistance recipients, and full-year Medicaid enrollees compared to MediPass and FFS beneficiaries.

To determine whether the existence of the MediPass program impacted the decision to enroll in HMOs, we ran a logistic equation on the choice of HMO over the alternative program(s) in FY93. Besides variables for demographic and Medicaid enrollment characteristics, we entered into the equation a dichotomous variable representing residence in the waiver counties to measure the program impact. The equation was run separately for children and adults.[6] The estimated coefficients are shown in appendix Table E-l.

The results show that children in MediPass counties were somewhat less likely to enroll in HMOs in FY93 compared to children in non-waiver counties, but that adults in MediPass counties were no more or less likely than adults in non-waiver counties to enroll in HMOs. Thus, the program may have had a slight dampening effect on the propensity for child enrollees to enroll in HMOs. However, the difference between the county groups could have resulted from other factors that varied between them for which we had no data-e.g., the ability of the HMOs in the different counties to take in new pediatric patients.

The estimated equations also show that infants were less likely to have enrolled in HMOs compared to older children and adults; Hispanics were less likely to have enrolled in HMOs compared to African-Americans and whites; and non-cash assistance beneficiaries (both SOBRA and other enrollees) were less likely to have enrolled in HMOs compared to cash assistance recipients. In addition, beneficiaries enrolled in Medicaid for longer durations were more likely to have enrolled in HMOs. The largest single determinant of HMO enrollment was enrollment in Medicaid under SOBRA, especially among adults. For the most part, these enrollees were pregnant women or newly delivered mothers. Holding constant SOBRA enrollment, adult females were significantly more likely to have enrolled in HMOs than adult males in FY93.

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[6] We also ran separate equations for beneficiaries in waiver and non-waiver counties. The results of these equations were similar to those reported here.

Table 4-2a. Percentage Distribution of Demographic and Medicaid Enrollment Characteristics Among Medicaid HMO Beneficiaries, Florida Waiver and Comparison Counties, FY91 and FY93

	MediPass Counties		Comparison Counties	
	FY91	FY93	FY91	FY93
Number of HMO beneficiaries	21,109	64,660	931	44,541
Age Group				
0-2 years	21.1	19.6	21.5	22.0
3-5 years	16.3	17.8	19.9	19.2
6-17 years	32.1	31.0	30.7	30.3
18-24 years	11.4	11.3	10.2	10.5
25+ years	19.1	20.3	17.7	18.0
Race/Ethnicity				
White	30.5	51.9	26.0	38.4
Hispanic	7.7	11.0	30.6	16.1
African American	59.9	35.5	40.9	43.4
Other	1.9	1.7	2.5	2.1
Gender				
Male	34.8	36.2	36.5	37.6
Female	65.2	63.8	63.5	62.4
Eligibility Category				
AFDC cash assistance recipients	85.4	75.5	82.1	70.9
Other eligible enrollees (non-cash)	12.3	13.5	9.4	14.3
SOBRA enrollees	2.3	11.0	8.5	14.8
Enrollment Duration				
Full year	85.2	72.5	75.6	72.8
Part year	14.8	27.5	24.4	27.2

Table 4-2b. Percentage Distribution of Demographic and Medicaid Enrollment Characteristics Among Medicaid MediPass and FFS Beneficiaries, Florida Waiver and Comparison Counties, FY91 and FY93

	MediPass Counties		Comparison Counties	
	FY91	FY93	FY91	FY93
Number of beneficiaries	138,396	177,494	86,602	111,078
Age Group				
0-2 years	26.3	25.0	26.2	25.1
3-5 years	14.5	14.5	15.5	14.1
6-17 years	27.7	29.7	28.8	29.8
18-24 years	13.9	12.2	13.2	12.3
25+ years	17.7	18.7	16.4	18.6
Race/Ethnicity				
White	52.4	53.9	38.8	44.5
Hispanic	13.2	14.3	18.0	20.6
African American	31.4	28.5	40.4	31.1
Other	3.0	3.3	2.9	3.7
Gender				
Male	34.1	37.5	33.7	37.2
Female	65.9	62.5	66.3	62.8
Eligibility Category				
AFDC cash assistance recipients	62.0	54.8	63.8	52.3
Other eligible enrollees (non-cash)	14.3	19.2	13.1	19.6
OBRA enrollees	23.7	26.1	23.1	28.1
Enrollment Duration				
Full year	65.3	57.3	70.5	57.1
Part year	34.7	42.7	29.5	42.9

2.2.2 Characteristics of the Study Population

All beneficiaries in the waiver and comparison counties who were not enrolled in HMOs in FY91 and FY93 made up the study population. Roughly two thirds of these beneficiaries were younger than 18 years of age and two thirds were female. The demographic characteristics of non-HMO beneficiaries were similar in the MediPass and comparison **counties,** with the exception of race/ethnicity. The MediPass counties had higher percentages of beneficiaries who were white (52-54 percent versus 39-45 percent) and lower percentages who were **African-**American (29-3 1 percent versus 3 l-40 percent) and Hispanic (13- 14 percent versus 18-21 percent).

The Medicaid enrollment characteristics of the study population changed somewhat over time. Although there was a greater number of AFDC cash assistance recipients in FY93 than in FY91 in both MediPass and comparison counties, these beneficiaries represented a smaller fraction of the study population as more of them opted to enroll in HMOs. Thus, even though no significant new eligibility expansions were passed in the State during the study period, the non-cash families with children and SOBRA enrollees represented slightly greater fractions of the study population in **FY93** compared to FY9 1. Medicaid enrollment of beneficiaries in these eligibility categories is often linked to medical care needs. Thus, they may be sicker and typically have shorter average enrollment durations. This may account for the decline in the fraction of the study population enrolled for the full year from FY91 to FY93.

2.2.3 Illness **Burden Among the Study Population**

To determine whether the populations of the different county groups differed in their health care needs, we computed illness burden measures using the Ambulatory Care Group system developed at Johns Hopkins University (Weiner et al., 1991). This system places each of the approximately 5,000 common ICD-9-CM' diagnosis codes into one of 32 clusters based on its expected relationship to health care resource use. These clusters called Ambulatory Diagnostic Groups (ADGs) are assigned to individuals based on the primary and secondary diagnoses on claims for inpatient and outpatient provider encounters made over a defined period of time (e.g., a year).' Over this period, a person may have had claims for a variety of conditions and therefore could be assigned several different ADGs.

The percentages of children and adults in the study population with selected ADGs are shown in Table 4-3. Because we do not have information on medical conditions among non-users, the percentages are based only on beneficiaries with claims. These data show very similar distributions of illness burden among the study subjects in the waiver and comparison counties in both FY91 and FY93. For most ADGs the percentage of the population using medical services who had at least one medical encounter for the condition was unchanged or increased slightly over time. The percentage increases were similar in the MediPass and comparison counties. The

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[7] *International Classification of Diseases, Ninth Revision, Clinical Modification.*

[8] Diagnoses on laboratory, radiology, and pharmacy claims are excluded to avoid "rule-out" diagnoses providers assign to patients before a definitive diagnosis is made.

Table 4-3. Percentage of Medicaid Beneficiaries with Selected Ambulatory Diagnostic Group (ADG) Clusters Among Beneficiaries with Medicaid Payments by Age Group, Florida Waiver and Comparison Counties, FY91 and FY93

	MediPass Counties		Comparison Counties		Difference in Difference
	FY91	FY93	FY91	FY93	
Children					
Time-limited, minor (1.2)	32.3	38.4	31.7	38.0	-0.2
Time-limited, major (3,4)	6.8	6.6	5.3	6.4	-1.3
Allergies (5)	2.1	2.7	2.3	2.6	0.3
Asthma (6)	2.8	4.4	2.4	3.5	0.5
Likely to recur (7,8,9)	21.2	24.7	19.3	22.4	0.4
Chronic medical, stable (10)	4.2	4.9	2.2	3 . 0	-0.1
Chronic medical, unstable (11)	1.8	1.7	1.3	1.8	-0.6
Chronic specialty, stable (12,13,14)	0.9	1.4	0.6	0.9	0.2
Chronic specialty, unstable (16,17,18)	0.4	0.5	0.4	0.5	0.0
Dermatologic (20)	2.0	2.9	2.2	2.6	0.5
Injuries/adverse effects, minor (21)	6.6	7.9	6.6	7.6	0.3
Injuries/adverse effects, major (22)	5.0	6.2	4.4	5.4	0.2
Psychosocial, acute, minor (23)	0.5	0.9	0.4	1.0	-0.2
Psychosocial, recurrent or persistent, stable (24)	1.4	2.3	1.0	1.7	0.2
Psychosocial, recurrent or persistent, unstable (25)	0.2	0.2	0.1	0.1	0.0
Malignancy (32)	0.1	0.1	0.1	0.1	0.0
Pregnancy (33)	1.9	1.4	1.5	1.5	- 0 . 5

Table 4-3 (continued)

	MedIPass Counties		Comparison Counties		Difference in Differences
	FY91	FY93	FY91	FY93	
Adults					
Time-limited, minor (1,2)	21.0	24.4	23.3	25.9	0.8
Time-limited, major (3,4)	13.4	11.6	11.7	11.4	-1.5
Allergies (5)	1.6	1.7	1.7	1.8	0.0
Asthma (6)	1.3	1.9	1.4	2.2	-0.2
Likely to recur (7,8,9)	18.2	20.2	19.5	20.5	1.0
Chronic medical, stable (10)	0.8	9.7	7.0	9.3	6.6
Chronic medical, unstable (11)	3.2	3.8	3.0	3.7	-0.1
Chronic specialty, stable (12,13,14)	0.7	1.5	1.0	1.4	0.4
Chronic specialty, unstable (16,17,18)	0.6	1.0	0.5	0.8	0.1
Dermatologic (20)	1.6	2.2	1.8	2.5	-0.1
Injuries/adverse effects, minor (21)	7.3	8.0	7.9	8.3	0.3
Injuries/adverse effects, major (22)	5.4	5.7	4.8	5.5	-0.4
Psychosocial, acute, minor (23)	1.1	1.7	1.1	1.7	0.0
Psychosocial, recurrent or persistent, stable (24)	3.3	5.0	2.9	3.8	0.8
Psychosocial, recurrent or persistent, unstable (25)	1.4	1.9	0.8	1.3	0.0
Malignancy (32)	0.3	0.4	0.2	0.4	-0.1
Pregnancy (33)	27.9	25.0	24.8	25.8	-3.9

one exception was for stable chronic medical conditions among adult beneficiaries. This percentage was exceedingly low in MediPass counties compared to the comparison counties in FY91 (0.8 percent versus 7.0 percent) but was higher in the MediPass counties than in the comparison counties in FY93 (9.7 percent versus 9.3 percent).

2.3 MediPass Participation

Among the non-HMO Medicaid beneficiaries in the four waiver counties, only 20.9 percent were covered under MediPass for their full Medicaid enrollment period in FY93 (Table 4-4). Another 28.2 percent were covered in FFS Medicaid first and subsequently participated in MediPass (i.e., delayed participation), and 11.9 percent participated in MediPass for at least one month during the year but disenrolled before the end of their Medicaid enrollment period and were covered by FFS Medicaid for the remainder of the year or their enrollment period. A full 39 percent of non-HMO, MediPass-eligible Medicaid beneficiaries in the waiver counties were covered only under FFS Medicaid in FY93.

2.3.1 Characteristics of MediPass Participants and Eligible Nonparticipants

The demographic and Medicaid enrollment characteristics of the study population in the waiver counties in FY93 are shown in Table 4-4 by level of MediPass participation. Beneficiaries with no MediPass participation were more likely to be adult and SOBRA enrollees and less likely to be African-American and cash assistance recipients compared to the overall MediPass eligible population in the waiver counties (see Table 4-2b). Conversely, full-period MediPass participants were more likely to be children, African American, cash assistance recipients, and full-year Medicaid enrollees. Beneficiaries with delayed participation were slightly more likely to be infants and part-year Medicaid enrollees. Beneficiaries who disenrolled from MediPass for FFS coverage were more likely to be enrolled in Medicaid for the full year.

2.3.2 Illness Burden Among MediPass Participants and Eligible Nonparticipants

To determine whether MediPass participants differed in their health care needs from eligible nonparticipants, we computed the percentages of Medicaid beneficiaries in waiver counties with selected ADGs broken out by their level of MediPass participation in FY93, as shown in Table 4-5. Again these tabulations were restricted to beneficiaries who had at least one medical care event during the year.

Compared to beneficiaries covered by MediPass for their full Medicaid enrollment period in FY93, MediPass-eligible beneficiaries in the waiver counties who were covered by FFS Medicaid only were less likely to have had care with the selected ADG clusters. The notable exception was pregnancy; only 15.9 percent of fully participating adult MediPass beneficiaries had pregnancy-related care in FY93 compared to 27.2 percent of beneficiaries with only FFS care. The percentages of beneficiaries with each of the ADG clusters were fairly similar across the three categories of MediPass participants-delayed, full-period, and disenrolled. Again the exception was pregnancy-related care which was received by a higher percentage of participants with delayed (22.6 percent) or discontinued (25 percent) MediPass coverage than by full-period MediPass participants.

Table 4-4. Percentage Distribution of Demographic and Medicaid Enrollment Characteristics Among Medicaid Beneficiaries by MediPass Participation, Florida Waiver Counties, FY93

	Non-participant	Delayed Participation	Full Participation	Disenrolled During Year
Number of beneficiaries	69,239	50,104	37,050	21,101
Percent of total	39.0	28.2	20.9	11.9
Age Group				
0-2 years	24.5	28.4	21.5	24.7
3-5 years	10.1	14.7	20.4	17.7
6-17 years	25.3	30.7	34.7	32.7
18-24 years	16.9	9.2	8.6	10.2
25+ years	23.2	17.0	14.8	14.7
Race/Ethnicity				
White	59.1	53.5	47.3	49.4
Hispanic	16.7	14.7	9.8	13.0
African American	20.3	28.9	39.9	34.7
Other	3.9	2.9	3.0	2.9
Gender				
Male	31.7	41.7	41.7	39.5
Female	68.3	58.3	58.3	60.5
Eligibility Category				
AFDC cash assistance recipients	48.0	52.4	68.9	57.7
Other eligible enrollment groups	18.7	24.1	18.1	21.2
SOBRA enrollees	33.3	23.5	13.0	21.1
Enrollment Duration				
Full year	54.4	44.7	71.0	72.1
Part year	45.6	55.3	29.0	27.9

Table 4-5. Percentage of Medicaid Beneficiaries with Selected Ambulatory Diagnostic Group (ADG) Clusters Among Beneficiaries with Medicaid Payments by Age Group and MediPass Participation, Florida Waiver Counties, FY93

	Non-participant	Delayed Participation	Full Participation	Disenrolled During Year
Children				
Time-limited, minor (1,2)	30.4	49.0	50.4	49.8
Time-limited, major (3.4)	5.9	8.9	5.4	7.7
Allergies (5)	1.9	3.3	4.2	3.4
Asthma (6)	2.7	5.1	7.1	6.2
Likely to recur (7,8,9)	17.7	32.1	33.4	32.5)
Chronic medical, stable (10)	2.5	5.8	7.7	6.5
Chronic medical, unstable (11)	1.5	2.2	1.9	2.3
Chronic specialty, stable (12,13,14)	0.8	1.7	2.0	1.7
Chronic specialty, unstable (16,17,18)	0.4	0.6	0.7	0.5
Dermatologic (20)	2.0	3.3	4.X	3.X
Injuries/adverse effects, minor (21)	5.X	9.2	12.5	10.7
Injuries/adverse effects, major (22)	4.3	7.3	Y.3	X.6
Psychosocial, acute, minor (23)	0.8	1.0	1.3	1.6
Psychosocial, recurrent or persistent, stable (24)	1.4	2.3	3.7	3.7
Psychosocial, recurrent or persistent, unstable (25)	0.1	2.3	0.2	0.4
Malignancy (32)	0.1	0.1	0.1	0.1
Pregnancy (33)	1.4	1.6	0.7	2.2

Table 4-5 (continued)

	Non-participant	Delayed Participation	Full Participation	Disenrolled During Year
Adults				
Time-limited, minor (1,2)	20.2	34.6	37.9	36.3
Time-limited, major (3,4)	10.3	14.4	13.5	15.9
Allergies (5)	1.3	2.6	3.2	2.9
Asthma (6)	1.7	2.7	2.6	3.0
Likely to recur (7,8,9)	16.0	2x.5	32.X	30.5
Chronic medical, stable (10)	7.1	14.2	16.6	15.1
Chronic medical, unstable (11)	3.0	s.7	5.5	6.1
Chronic specialty. stable (12,13,14)	1.1	2.4	2.2	2.5
Chronic specialty. unstable (16,17,18)	0.6	1.5	1.6	1.8
Dermatologic (20)	1.8	3.3	3.8	3.3
Injuries/adverse effects, minor (21)	6.3	11.8	13.0	12.6
Injuries/adverse effects, major (22)	4.4	x.5	x.0	8.8
Psychosocial, acute, minor (23)	1.3	2.4	2.x	3.0
Psychosocial, recurrent or persistent, stable (24)	3.0	7.4	8.5	x.4
Psychosocial, recurrent or persistent, unstable (25)	1.2	2.8	2.8	3.8
Malignancy (32)	0.3	0.6	0.6	0.6
Pregnancy (33)	27.2	22.6	15.9	25.0

The finding of fewer ADG clusters among the FFS only group is partially explained by their shorter Medicaid enrollment durations. The greater the number of months enrolled in Medicaid, the more likely the beneficiaries were to have had medical care and to have had a wider variety of diagnoses. Among our study population in FY93, 25 percent of beneficiaries in MediPass counties with only FFS coverage were enrolled in Medicaid for four or fewer months whereas less than 2 percent of beneficiaries enrolled in MediPass for their full Medicaid enrollment were enrolled for four months or less. Nevertheless, a majority of FFS only beneficiaries (54.4 percent) classified as MediPass-eligible were enrolled in Medicaid for the full year. In addition, when we restrict the sample to those beneficiaries enrolled for six months or more, we see the same patterns of greater percentages of enrollees with any of the ADG clusters, except pregnancy, among participants compared to nonparticipants.

These differences between MediPass participants and nonparticipants suggest that we take care in interpreting the results of our evaluation. The program effect at the "four-county-level" is the sum of the direct effect of the program on those in the program and the indirect effect of having a certain group intentionally left out of the program for parts or all of the fiscal year.

3.   Research Questions and Hypotheses

We investigated the MediPass program's success in achieving four goals of PCCM programs: (1) improve access to primary health care; (2) promote the use of preventive care services; (3) change patterns of service use; and (4) control health care expenditures. Our approach and the specific measures we used to assess the program's success along each of these dimensions is described below and summarized in Table 4-6.

3.1   Improve **Access to Primary Health Care**

Access is difficult to measure with claims data. Claims data provide measures of service use, which reflect not only the availability and accessibility of services but also the aggressiveness of outreach and education efforts, and are confounded by levels of medical need and other unobserved factors. Therefore, results from the claims data analysis can only provide evidence supporting or refuting improveu access to care, but cannot be used to definitively prove the success of the program in meeting this goal.

We were able to construct several measures from the Florida claims data files that were indicative of access to care. First, we hypothesized that enrollees with compromised access to care would forgo routine primary care. Therefore, although an increased number of ambulatory days of care alone would not necessarily be representative of improved access, in combination with other measures, it would indicate that access had not deteriorated under the program.

Second, we hypothesized that enrollees with compromised access to routine care would be more likely to enter the health care system through emergency rooms (ERs) and would be more likely to be hospitalized for preventable, ambulatory care sensitive conditions (ACSCs).

Table 4-6. Measures Used to Analyze the Success of MediPass in Achieving Specific Goals

	Access	Preventive Care	Use Patterns	Cost Control
Any outpatient days of care	✗		✗	
Number of outpatient days of care	✗		✗	
Any ER visits	✗		✗	
Number of days of care with ER visits	✗		✗	
Any outpatients laboratory or radiology			✗	
Number of days with lab or xray services			✗	
Compliance with well-child schedule	✗	✗		
Compliance with immunization schedule	✗	✗		
Compliance with annual pap smears	✗	✗		
Any drug claims			✗	
Number of drug claims			✗	
Any nondelivery hospital stays			✗	
Number of non-delivery hospital days			✗	
Number of delivery days			✗	
Any hospitalizations for ACSCs	✗			
Any Medicaid payments				✗
Total Medicaid payments				✗

We constructed measures for whether enrollees had any ER visits, the number of ambulatory days of care with ER visits, and whether the enrollee had any hospitalizations for **ACSCs.** A list of ACSCs relevant to a Medicaid population was developed specifically for this project by our physician consultant. These conditions and the diagnosis codes and other restrictions used to compute them are shown in Appendix A.

3.2 Promote Preventive Care

The success of the MediPass program in promoting preventive care is easier to measure with claims data because of the age-specific guidelines for receipt of such care. We could measure the success of the MediPass program relative to FFS Medicaid, as well as against accepted national standards. In particular, we investigated the extent to which preschool-aged children had EPSDT screening visits and had received immunizations for childhood diseases. In addition, we investigated whether the MediPass program had any effect on whether women in child-bearing ages (19 to 39 years) received annual pap smears. We hypothesized that primary care case management under MediPass improved compliance with national guidelines for the receipt of these preventive care services.

EPSDT screening visits are comprehensive well-child visits. States must have a recommended periodicity schedule for EPSDT screening visits. In many states, including Florida, this schedule is identical to the American Academy of Pediatrics (AAP) schedule for health supervision visits (Orloff et al., 1992). The AAP schedule recommends six visits in the child's first year of life, three visits in the child's second year, an annual visit from ages three to six years, and a visit every other year from ages seven to 20 years. We computed the percentage of children with any EPSDT visits. In addition, we computed an index for preschool-aged children that measures compliance with the AAP-recommended schedule of health supervision visits adjusting for the child's age at the end of the year and the number of months the child was enrolled in Medicaid during the year.

The AAP recommends that certain childhood immunizations be administered to children at specific intervals that coincide with the health supervision visits. These immunizations are often billed separately and, therefore, have their own claims records. With these records, then, we investigated compliance with the AAP periodicity schedules for three common childhood immunizations among children aged 2 to 30 months: (1) the diphtheria-tetanus-pertussis (DTP) series recommended at **2, 4, 6,** and 18 months of age; (2) the oral polio vaccine (OPV) series recommended at **2, 4,** and 18 months of age; and (3) the measles, mumps, and rubella (MMR) vaccine recommended at 15 months of age.

Compliance indexes similar to the EPSDT visit index described above were computed for these immunizations and for the three vaccines combined. Details of how we computed the indexes and a list of the procedure codes used to identify EPSDT visits, the immunizations, and pap smears are provided in Appendix B.

Finally, because pap smears are part of regular prenatal care, we excluded women who were pregnant during the analysis year from our measure of compliance with the annual pap smear recommendation. In this manner, we were certain to be measuring "preventive" care

compliance. In doing so, we also eliminated the bias resulting from disproportionately fewer pregnant women participating in MediPass for their full Medicaid enrollment period.

3.3   Change Patterns of Service Use

A fundamental tenet of all PCCM programs is that improved primary and preventive care will reduce the need for more costly and inappropriate treatment services. Thus, a successful program might be reflected in an increase in the use of primary and preventive care with a concurrent reduction in the use of laboratory and radiology examinations, medications, and the number of hospital stays and inpatient days of care.

However, among a population with a significant amount of unmet health care needs, increased access to routine primary care can initially result in increased use of these latter services. Because we do not know the level of unmet need among the Florida Medicaid population and because our analysis is not designed to track individuals' health service use over time, we made no predictions of the impact of the MediPass program on these measures. If there are unmet needs and these needs differ systematically between the waiver and comparison counties or between program participants and nonparticipants, then the estimated effect of the program will reflect a combination of the effect of PCCM and the differences in the distribution of these unmet needs.

As we discovered above, whereas illness burden as reflected in diagnosis codes on the claims data do not vary between the county groups, they do vary between **FY93** program participants and nonparticipants. Our approach for controlling for these differences is described below.

3.4   Control Health Care Expenditures

Besides improved health outcomes, a desired outcome of **all** managed care programs is reduced total health care costs. It is hoped that the increased expenditures for primary and preventive care services and the added case management fees will be more than offset by reduced expenditures from less expensive treatment and fewer hospitalizations and ER services.

However, because data for the analysis were collected for an early year of MediPass enrollment, we may see little, if any, reduction in overall costs per enrollee. Beneficiaries may have been poorly covered by health insurance and/or poorly served by primary care providers prior to enrollment in Medicaid or the MediPass program. As explained above, many of these beneficiaries may have had a backlog of health care needs that would temporarily increase diagnostic and treatment services once they gained improved access to primary care under the program. Again, because of these concerns we control for differences in the distribution of illness burden.

4. Methodology

We performed both tabular descriptive and multivariate regression and **probit** analyses. In addition, we estimated what the costs of care would have been in the waiver counties under traditional FFS Medicaid in the absence of the MediPass program. Our approach to each of these analyses is described below.

4.1 Descriptive Analysis

For the descriptive analysis, we broke the study population out into six groups: (1) children who were AFDC cash assistance recipients, (2) children in families enrolled under non-cash eligibility categories, (3) children enrolled under **SOBRA** expansion categories, (4) adults who were AFDC cash assistance recipients, (5) adults in families enrolled under **non-**cash eligibility categories, and (6) adults enrolled under other **SOBRA** expansion categories (e.g., pregnant women). If an individual was eligible under more than one of these categories during the year, he or she was grouped into the category under which he or she was enrolled for the greatest number of months that year.

In the analysis of the service use and expenditure measures, we first compared the probability and levels of use among beneficiaries in the different county groups and within county groups over time. Then, we compared the changes over time across the county groups (i.e., the difference in differences). Only by this last comparison, which controls for the independent effects of both secular trends and initial differences between the county groups, could we tell whether the MediPass program had a meaningful impact on health service use.

The difference in differences (DD) is measured by subtracting the change in the measure of interest from **FY91** to FY93 in the comparison counties from the change in the measure from **FY91** to FY93 in the waiver counties:

$$DD = (Y_{93 \cdot w} - Y_{91 \cdot w}) - (Y_{93 \cdot c} - Y_{91 \cdot c})$$

A positive sign indicates that the measure increased more (or decreased less) in the waiver counties than in the comparison counties, and a negative sign indicates that it decreased more (or increased less) in the waiver counties compared to the non-waiver counties. Essentially, if an increase in the measure is considered a desirable program effect, as in the case of preventive care use, then we are looking for a positive sign on the DD. Alternatively, if a decrease in the measure is considered a desirable program effect, as in the case of emergency room visits, then we are looking for a negative sign on the DD.

4.2 Multivariate Model

A limitation of the tabular analysis is that it fails to control for other factors that may influence service use and costs (e.g., age, race, gender, illness burden). Therefore, we extended our bivariate analysis to multivariate regression and **probit** analyses in which we estimated first

the impact of the MediPass program on the four-county area as a whole and then on the beneficiaries in the waiver counties by their level of involvement in the MediPass program.

The basic analytic model is a **pre/post,** comparison group design:

$$Y_{it} = \alpha + \gamma_T T_t + \gamma_E E_{it} + \gamma_{TE} TE_{it} + \beta X_{it} + u_{it}$$

where
- Y is the dependent variable;
- i indexes the individual;
- t indexes the year;
- X is a vector of regressors that vary over time and across people;
- E indicates if the person lived in a MediPass county ($E=1$) or a comparison county ($E=0$);[9] and
- T indicates if the observation is for **FY93** (T=1) or **FY91** (T=O).

The program effect is estimated by the coefficient of the indicator variable TE that represents the interaction of the **pre/post** indicator T and the waiver/comparison group indicator E. This coefficient measures the difference between the waiver and comparison groups in the change in the outcome measure over time, holding constant X, i.e., $\gamma_{TE} = [(Y_{T=1,E=1} - Y_{T=0,E=1}) - (Y_{T=1,E=0} - Y_{T=0,E=0})]_X$ or the difference in differences. Entered as such it measures the net overall impact of the MediPass program on the population included in the regression. For the probability of any service use, we used a **probit** model and present normalized **probit** estimates of the coefficients." For the level of use among users of services, we ran ordinary least squares **(OLS)** regressions on log transformed dependent variables.

To determine the differential impact on beneficiaries in waiver counties by their level of participation, we reran each equation replacing the TE variable with indicator (dichotomous) variables for four mutually exclusive categories of MediPass participation-late enrollees, full-period enrollees, disenrollees, and nonparticipants.[11] We controlled for varying Medicaid enrollment durations by including a variable indicatⁱrg the number of months the person was enrolled in Medicaid during the year. A full list of the control variables used in the multivariate equations is provided in Table 4-7.

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[9] The E variable was replaced by seven county fixed effect (dichotomous) variables, which controlled for other unobservable county-specific factors, as well as being a waiver county.

[10] Normalized **probit** estimates are calculated for the j'th variable as $\beta_j \phi(z)$, where $z = \Phi^{-1}(p)$, p is the sample mean of the response variable, Φ^{-1} is the inverse of the standard normal cumulative density function, and β_j is the **probit** coefficient for the variable. The change in probability for changes in dichotomous variables is calculated for a discrete change of the dichotomous variable from 0 to 1. The normalized coefficients for **continuous variables correspond** to the incremental change in the probability of enrolling in MediPass for an infinitesimal change in the independent variable.

[11] Beneficiaries who enrolled in the MediPass program in **FY93** after their first month of Medicaid enrollment that year (i.e., late enrollees) and who subsequently disenrolled before the end of their FY93 Medicaid enrollment period are classified as disenrollees.

Table 4-7. Independent Variables for the Regression Analyses

Demographic variables:
- age,
- gender, and
- race/ethnicity (white, Hispanic, African American, and other).

Medicaid eligibility and enrollment variables:
- number of months enrolled during the year; and
- eligibility category (AFDC cash assistance; other non-cash categories, including Ribicoff children; and poverty-related expansion or SOBRA).

Illness burden:
- ambulatory diagnostic group clusters

Program variables:
- interaction between the FY93 year indicator and the indicator for residence in a MediPass county; and
- MediPass participation (full, delayed, disenrolled, and not participating).

County-level fixed effects

4.3 Selection Bias

The estimated coefficients for the four MediPass participation indicators provided evidence of a systematic difference in the patterns of service use and expenditures between Medicaid enrollees who participated in MediPass and those who did not-nonparticipants were less likely to use services and used significantly fewer services. If nonparticipants were not being enrolled because of some random process related to administrative problems (e.g., staffing limitations), then we should not see any systematic differences in service use and expenditures between comparison county beneficiaries and MediPass county beneficiaries who were not enrolled in MediPass (controlling for county, year, and demographic factors).

However, the differences that we found between nonparticipants in MediPass counties and comparison county beneficiaries, after controlling for Medicaid enrollment duration, suggest that there was an underlying process influencing enrollment that may bias the estimated effect of the program. In particular, if beneficiaries with fewer needs were systematically less likely to participate in MediPass, then they would appear to have had lower service use than comparison county beneficiaries and beneficiaries in the MediPass program.'*

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[12] Ideally we would estimate a He&man-Lee model to control for the process of sample selection. However, to properly identify such a model requires instrumental variables that are correlated with the decision to enroll and but arc correlated with the probability and level of service use. The variables available for our analyses were limited **to claims-based data and county fixed** effects. Given this limitation, Heckman-Lee models of sample selection serve only as a very specific specification test; in these cases, the sample selection term is a non-linear function of all of the regressors in the model. Many economists feel this is an insufficient correction for

If the process that is driving the differences in service use and expenditures between MediPass participants and nonparticipants is health status, then the addition of case-mix adjustors to the equations may control for the influence of the differences on the program impact variables. Because we found significant differences between beneficiaries who participated in MediPass and those who did not participate, we added dichotomous variables for the 32 ADG clusters to the service use and payments equations.[13] However, for equations that were run on the full study population—the probabilities, respectively, of any outpatient care, any outpatient medications, any inpatient care, any hospitalizations for ACSCs, and any Medicaid payments-we could not add the ADG variables because we had no information on the health status of persons with no contacts with health providers during the year-i.e., there would be no variation in the ADG variables among enrollees with no medical care.

4.4   Counterfactual Simulations of Medicaid Expenditures under FFS

To estimate what Medicaid expenditures would have been in the waiver counties in the absence of the MediPass program, we used a two-part model (Duan et al., 1983). In the first stage, we estimated a probit equation to model the probability of having positive expenditures:

$$P_{it} = Pr(Expenditures_{it} > 0) = f(X_{it}\beta_1 + \epsilon_{1it})$$

In the second stage, we estimate a log-linear model to explain the variation in expenditures conditional on having non-zero expenditures:

$$\log(Expenditures_{it} \mid \textbf{Expenditures, > 0}) = X_{it}\beta_2 + \epsilon_{2it}$$

Because we used a log-linear model, we had to retransform log expenditures using a smearing factor as described by Duan et al (1983) before simulating the counterfactual expenditures. Therefore, expected Medicaid expenditures from the two-part model are:

$$E\,(\textbf{Expenditures,} \mid X_{it}) = P_{it}\phi \exp(X_{it}\beta_{2it})$$

where the retransformation factor, ϕ, is equal to:

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sample selection. In tests of this model on the probability and level of Medicaid payments, we also felt that the correction was insufficient and therefore did not further consider this type of adjustment.

[13] If health status measured in this way is a function of the MediPass program, then the ADGs may be endogenous and would confound the relationship between outcomes and the MediPass program. To avoid this potential limitation, we would have liked to have measured health status as a function of the ADGs in the periods prior to our analysis (i.e., 1989 for 1990 claims and 1992 for FY93 claims). Unfortunately, we did not have these data.

$$Exp(\sigma^2_{\epsilon_2}/2)$$

and σ^2 is the variance of the error term from the second stage.

To perform this simulation we estimated the equations above using data from the comparison counties for FY91 and FY93. The regressors in both models were identical, except for the addition of indicators for the 32 ADGs which were added to the second stage equation. To limit the influence of outliers on the results of the second stage, we limited this regression to those values within three standard deviations of the mean value of expenditures. We then applied the estimated coefficients to data from FY93 MediPass counties to simulate what average expenditures in FY93 would have been if the non-HMO beneficiaries in the waiver counties were under a FFS system.

5.   Results

5.1   Access to Care

As described above, we investigated different service use measures to determine the programs's impact on access to care. These include ambulatory days of care, the setting of ambulatory care in general and ER visits in particular, and hospitalizations for ACSCs.

51.1   Total Ambulatory Care Days

The percentage of enrollees with any ambulatory days of care and the number of ambulatory days per enrollee with at least one day are shown in Table 4-8 by eligibility category, county group, and year. The percentage of beneficiaries with any ambulatory care and the number of days of care was fairly comparable in the MediPass and comparison counties, with beneficiaries in MediPass counties experiencing slightly more days of care.

The percentage of beneficiaries with any days of care increased from FY91 to FY93 in all eligibility categories and both county groups. The largest increases were experienced among children in MediPass counties. The number of ambulatory care days among beneficiaries with some care also increased slightly in most eligibility categories from FY91 to FY93, with the largest increase among pregnant women enrolled under the SOBRA expansion categories. The increase was similar in the MediPass and comparison counties.

The results of the multivariate analyses, shown in Table 4-9, suggest that the MediPass program increased the percentage of children in the waiver counties with ambulatory care a small, but statistically significant, 1.8 percentage points from FY91 to FY93 but did not affect the percentage of adults with ambulatory care. The program also had a statistically significant, negative impact on the number of ambulatory care days among children with some care and a statistically significant, positive impact on the number of ambulatory care days among adults with some care. However, both effects were small.

Table 4-8. Percentage of Medicaid Beneficiaries with at Least One Ambulatory Day of Care and the Number of Ambulatory Days of Care per Beneficiary with Ambulatory Care by Eligibility Group, Florida Waiver and Comparison Counties, FY91 and FY93

	MediPass Counties		Comparison Counties		Difference
	FY91	FY93	FY91	FY93	Differences
Percentage of Beneficiaries with Ambulatory Care Days					
AFDC cash children	**52.6**	60.1	51.0	55.2	3.3
Non-cash children	**51.5**	67.7	49.4	64.9	0.7
SOBRA children	**48.7**	58.2	44.0	54.2	-0.7
AFDC cash adults	**51.0**	58.8	53.0	58.2	2.6
Non-cash adults	**52.1**	52.8	50.8	54.6	-3.1
SOBRA adults	**70.6**	73.7	66.8	73.9	-4.0
Number of Ambulatory Care Days Per Beneficiary with Events					
AFDC children	**5.5**	6.1	4.9	5.9	-0.4
Non-cash children	**5.9**	6.5	5.0	6.1	-0.5
SOBRA children	6.5	6.4	6.0	6.2	-0.3
AFDC cash adults	8.1	9.1	7.8	8.5	0.3
Non-cash adults	7.5	7.2	6.9	6.8	-0.2
SOBRA adults	9.3	11.8	8.5	10.8	0.2

Table 4-9. Estimated Coefficients for the Differences in the Probability and Number of Ambulatory Care Days in Florida Waiver and Comparison Counties from FY91 to FY93

	Probability of Any Ambulatory Care Days[1]		Number of Ambulatory Care Days/User[2]	
	Children	Adults	Children	Adults
All beneficiaries in MediPass counties	.018** (5.22)	.001 (0.26)	-.019** (-3.43)	.062** (6.63)
Delayed participation	.162** (39.73)	.206** (33.57)	-.029** (-4.59)	.079** (7.18)
Full participation	.211** (49.3 1)	.226** (33.53)	.026** (3.96)	.071** (5.85)
Disenrolled during year	.185** (36.58)	.233** (29.48)	-.037** (-4.94)	.042* (3.09)
Nonparticipant	-.286** (-70.63)	-.223** (-38.42)	-.052** (-7.05)	.050** (4.62)

[1] Not adjusted for Ambulatory Diagnostic Groups.
*Adjusted for Ambulatory Diagnostic Groups.
** $p \leq .001$
* $p \leq .01$

Table 4-9 also shows the results of the multivariate analyses with the program impact broken out by MediPass participation. Both children and adults participating in the program were about 20 percentage points more likely to have had any ambulatory care days compared to the comparison groups. Children in the waiver counties who did not participate in MediPass during FY93 were 29 percentage points less likely to have had any ambulatory care days, and nonparticipating adults in waiver counties were 22 percentage points less likely to have had any ambulatory care days that year.

Among beneficiaries with any ambulatory care days, only children who participated in MediPass for their full Medicaid enrollment period had a significantly greater number of ambulatory care days compared to comparison children. Both participating and nonparticipating adult beneficiaries in waiver counties had a significantly greater number of ambulatory care days.

51.2   The Setting of Care

The percentage distribution of ambulatory days by setting of care in the waiver and comparison counties is shown in Table 4-10. A shift toward office-based care and away from institutional care, such as hospital outpatient department and ER care, is evident in both the MediPass and comparison counties.

Table 4-10. Percentage Distribution of Ambulatory Care Days by Setting of Care in Florida Waiver and Comparison Counties, FY91 and FY93

	MediPass Counties		Comparison Counties		Difference in Differences
	FY91	FY93	FY91	FY93	
Office	43.9	**47.3**	44.1	**48.8**	**-1.3**
Outpatient dept.	14.6	13.2	12.4	11.9	-0.9
Emergency room	10.9	7.1	13.6	10.5	-0.7
Health center	8.0	7.0	6.2	4.3	0.9
Other setting	6.1	5.1	5.7	6.0	-1.3
Unknown setting	16.5	20.3	18.0	18.6	3.2

The shift away from ER care was more dramatic in the MediPass counties than in the comparison counties. As shown in Table 4- 11, the percentage of beneficiaries with any ER visits was fairly consistent across county groups. Except among pregnant women eligible under the SOBRA expansions, the percentage of beneficiaries with ER visits fell more in waiver counties than in comparison counties from FY91 to FY93 by 4.3 to 8.5 percentage points. There was little difference in the number of ER visits per beneficiary with visits across eligibility and county groups and virtually no change in the number of ER visits per user from FY91 to FY93.

The multivariate results support the descriptive results (Table 4-12). Children in the MediPass counties were 8.8 percentage points less likely to have had an ER visit in FY93 than children in the comparison groups; adults in the MediPass counties were 4.9 percentage points less likely. The multivariate results also show significant declines in the number of ER visits per beneficiary with ER visits.

In the multivariate analyses that break out the program effect by level of MediPass participation, the largest declines in ER use were found among beneficiaries who participated in the program for their full Medicaid enrollment period. Except for the probability of any ER visits among children, the coefficients for nonparticipants were not statistically significant. Thus, the negative impact on ER visits appears to be a true program effect.

However, whether the program effect is a true reduction in the use of ERs among beneficiaries or simply a reduction in Medicaid payments for such care cannot be determined from the claims data. Federal law against patient dumping obligates hospitals and emergency care physicians to evaluate and screen all patients presenting to the ER. During the study period, Florida's Medicaid program paid for the evaluation and screening of MediPass patients presenting to ERs for non-emergencies through hospital cost reports rather than through a triage fee per patient. Hence, no claims records were generated, and we had no way to count these

Table 4-11. Percentage of Medicaid Beneficiaries with at Least One Emergency Room (ER) Visit and the Number of Ambulatory Care Days with ER Visits per Beneficiary with ER Visits by Eligibility Group, Florida Waiver and Comparison Counties, FY91 and FY93

	MediPass Counties		Comparison Counties		Difference
	FY91	FY93	FY91	FY93	in Differences
Percentage of Beneficiaries with ER Visits					
AFDC cash children	43.2	32.9	44.7	42.9	-8.5
Non-cash children	43.5	31.2	44.2	36.6	-4.7
SOBRA children	43.1	30.7	43.8	39.8	-8.4
AFDC cash adults	45.5	36.7	51.4	46.9	-4.3
Non-cash adults	40.2	32.5	44.9	42.4	-5.2
SOBRA adults	27.6	31.0	30.6	33.6	0.4
Number of Ambulatory Care Days with ER Visits Per Beneficiary with ER Visits					
AFDC cash children	1.7	1.5	1.8	1.8	-0.2
Non-cash children	1.7	1.6	1.8	1.8	-0.1
SOBRA children	1.7	1.5	1.8	1.8	-0.2
AFDC cash adults	1.9	1.7	2.0	1.9	-0.1
Non-cash adults	1.7	1.6	1.8	1.7	0.0
SOBRA adults	1.5	1.6	1.6	1.7	0.0

**Table 4-12. Estimated Coefficients for the Differences in the Probability
and Number of ER Visits Among Beneficiaries with Ambulatory Care Days
in Florida Waiver and Comparison Counties from FY91 to FY93**

	Probability of Any ER Visits[1]		Number of ER Visits/User	
	Children	Adults	Children	Adults
All beneficiaries in MediPass counties	-.088** (-17.80)	-.049** (-6.78)	-.073** (-10.86)	-.037** (-3.72)
Delayed participation	-.082** (-15.15)	-.067** (-7.94)	-.074** (-9.70)	-.065** (-5.53)
Full participation	-.112** (-19.81)	-.118** (-12.94)	-.109** (-13.20)	-.090** (-6.85)
Disenrolled during year	-.072** (-11.08)	-.072** (-6.80)	-.080** (-8.61)	-.058** (-3.92)
Nonparticipant	-.062** (-9.61)	.012 (1.39)	-.006 (-0.60)	.027 (2.27)

[1] Adjusted for Ambulatory Diagnostic Groups.
** p ≤ .001
* p ≤ .01

visits.[14] A survey conducted by the Florida Hospital Association found that MediPass denied payment to hospitals and physicians for 43 percent of the 5,500 MediPass beneficiaries who went to the ER from January to June 1995 (Managed Medicare *and Medicaid,* April 8, 1996).

5.1.3 Hospital Stays for Ambulatory Care Sensitive Conditions

An ACSC was given as either the primary or secondary diagnosis for a significant portion of hospitalizations among the study population-one third to one half of all hospitalizations among children and 10 to 20 percent of all hospitalizations among adults (Table 4-13). The percentage of children with any hospitalizations for ACSCs was similar in MediPass and comparison counties in FY91. This percentage declined from FY91 to FY93 among AFDC cash and SOBRA children in both county groups, with slightly greater declines in the MediPass counties. The percentage of non-cash children with hospitalizations for ACSCs increased over the study period with a slightly lower increase in the MediPass counties. Adult beneficiaries in MediPass counties were slightly more likely to have had a hospitalization for ACSCs in FY91 but were in line with the percentage in comparison counties by FY93.

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[14] Beginning in July of 1996, AHCA began paying a triage fee for the evaluation and screening of non-emergency ER visits to those hospitals that pay their physicians under contract. Thus, claims are now submitted for these services. However, hospitals with salaried ER physicians are still paid through hospital cost reports for denied ER visits for MediPass patients.

Table 4-13. Percentage of Medicaid Beneficiaries with at Least One Hospitalization for Ambulatory Care Sensitive Conditions (ACSCs) and the Percentage of Hospitalizations That Were for ACSCs by Eligibility Group, Florida Waiver and Comparison Counties, FY91 and FY93

	MediPass Counties		Comparison Counties		Difference in Differences
	FY91	FY93	FY91	FY93	
Percentage of Beneficiaries with ACSC Hospital Events					
AFDC cash children	1.8	1.2	1.5	1.4	-0.5
Non-cash children	1.7	2.6	1.6	2.9	-0.4
SOBRA children	2.1	1.3	2.3	1.7	-0.2
AFDC cash adult	2.3	1.6	1.4	1.6	-0.9
Non-cash adult	2.3	1.4	1.2	1.3	-1.0
SOBRA adult	3.9	1.2	1.7	1.5	-2.5
Percentage of Hospitalizations that were for ACSCs					
AFDC cash children	38.8	38.8	41.7	46.7	-5.0
Non-cash children	34.3	37.7	37.0	39.2	1.2
SOBRA children	31.8	41.4	40.0	48.5	1.1
AFDC cash adult	15.8	13.8	10.0	14.4	-6.4
Non-cash adult	15.2	21.1	9.7	19.0	-3.4
SOBRA adult	8.7	3.6	4.5	4.1	-4.7

The top four conditions accounting for two-thirds of ACSC hospitalizations among Florida Medicaid beneficiaries in FY9 1 and FY93 were bacterial pneumonia, dehydration secondary to another disease, asthma, and dehydration as a primary diagnosis (Table 4-14). The MediPass counties had an unusually high number of hospitalizations for dental conditions in FY91 (15.7 percent of all ACS hospitalizations).

The results of the multivariate analyses, shown in Table 4-15, support the hypothesis that primary care case management reduces the incidence of hospitalizations for ACSCs. There was a small, but significant, 0.1 percentage point drop in the ACS hospitalizations among MediPass participants in the waiver counties and a significant 0.2 percentage point drop among adults in the waiver counties. The drop among adults was experienced among participants and nonparticipants alike.

Taken together the results from the analyses of ambulatory care days, ER visits, and ACSC hospitalizations suggest that access to primary health care was not compromised under

Table 4-14. Percentage of ACS Hospitalizations (and Rank Order) of the Top Twelve Ambulatory Care Sensitive Conditions Resulting in Hospital Events, Florida Waiver and Comparison Counties, FY91 and FY93

	Waiver Counties		Comparison Counties	
	FY91	FY93	FY91	FY93
Dehydration, secondary diagnosis	20.3 (1)	25.4 (1)	19.9 (2)	21.7 (1)
Bacterial pneumonia	16.5 (2)	15.1 (3)	22.0 (1)	19.4 (2)
Asthma	13.2 (4)	21.0 (2)	14.6 (3)	17.5 (3)
Dehydration, primary diagnosis	6.8 (5)	7.2 (4)	11.0 (4)	12.6 (4)
Kidney/urinary tract infection	5.2 (6)	5.6 (5)	4.3 (7)	4.7 (5)
Jaundice	3.7 (7)	3.8 (7)	5.7 (5)	4.5 (6)
Pelvic inflammatory disease	3.6 (8)	3.7 (8)	5.1 (6)	3.4 (7)
Cellulitis	3.3 (9)	4.4 (6)	3.5 (8)	3.3 (8)
Failure to thrive	3.0 (10)	2.8 (9)	2.9 (9)	2.7 (9)
Chronic obstructive pulmonary disease	1.6 (11)	2.6 (10)	2.5 (10)	2.7 (10)
Congestive heart failure	1.2 (13)	1.2 (13)	1.6 (11)	1.6 (11)
Dental conditions	15.7 (3)	0.3 (19)	0.4 (16)	0.1 (21)

Table 4-15. Estimated Coefficients for the Differences in the Probability of Hospitalizations for Ambulatory Care Sensitive Conditions in Florida Waiver and Comparison Counties from FY91 to FY93

	Probability of Hospitalization for Ambulatory Care Sensitive Conditions	
	Children	Adults
All beneficiaries in MediPass counties	-.001** (-3.19)	-.002** (-6.23)
Delayed participation	-.001** (-3.87)	-.002** (-4.13)
Full participation	-.001** (-3.79)	-.002** (-6.21)
Disenrolled during year	-.001 (-2.01)	-.002** (-3.67)
Nonparticipant	.000 (0.03)	-.002** (-5.48)

[1] Not adjusted for Ambulatory Diagnostic Groups.
** p ≤ .001
* p ≤ .01

Florida's MediPass program compared to FFS Medicaid and may even have improved. Children and adults participating in the program had increased ambulatory care days, fewer emergency room visits, and fewer hospitalizations for conditions sensitive to primary health care. Access to primary care is also reflected in the receipt of preventive health care at recommended time intervals as discussed below.

5.2 Preventive Care

Below we present the results of our investigation of three measures of compliance with national preventive care standards: (1) compliance with the EPSDT periodicity schedule among preschool-aged children; (2) compliance with childhood immunization schedules for children aged two to 30 months of age; and (3) compliance with annual pap smear recommendations for women in childbearing ages.

5.2.1 EPSDT Visits

Only 20.4 percent of Medicaid children in the MediPass counties and 17 percent of Medicaid children in the comparison counties had any EPSDT screening visits in FY91 (Table 4-16). These percentages rose to 22.1 percent and 17.8 percent, respectively, in FY93. The increase in the MediPass counties exceeded the increase in the comparison counties by 0.9 percentage points. Children in the non-cash eligibility groups had the greatest gain in EPSDT

Table 4-16. Percentage of Medicaid Beneficiaries Aged O-17 Years with at Least One EPSDT Visit by Eligibility Group, Florida Waiver and Comparison Counties, FY91 and FY93

	MediPass Counties		Comparison Counties		Difference in Differences
	FY91	FY93	FY91	FY93	
All children	20.4	22.1	17.0	17.8	0.9
AFDC cash	20.5	19.8	16.7	15.7	0.3
Non-cash	18.6	29.2	15.7	23.6	2.7
SOBRA	21.0	21.5	18.2	17.5	1.2

participation over the study period. These percentages are all very low but are in line with those found in other states in the early 1990s (US GAO, 1993; Gavin et al., 1997). Many additional children may have received health screens during a visit that was billed as an illness-related comprehensive office visit. As mentioned above in Section 2.1 because of the higher reimbursement rate and lower administrative burden of comprehensive office visits compared to EPSDT visits, providers would bill for a comprehensive office visit over an EPSDT visit if the child had a medical condition that had an allowable diagnosis for reimbursement.

To measure compliance with the periodicity schedule, we computed an EPSDT visit completion rate for children under six years of age. The rate determines the percentage of completed visits among the visits children were expected to receive based on the AAP periodicity schedule, the child's age at the end of the year, and the number of months the child was enrolled in Medicaid during the year." These rates are shown in Table 4- 17 separately for children aged two months to two years and children aged three to five years and for all children aged two months to five years by eligibility category.

Children under three years of age had multiple recommended visits (as many as six visits) during the 12 months of FY93. These younger preschoolers in MediPass counties completed only 2 1 percent of the recommended visits in FY9 1 whereas children in this younger age group in comparison counties completed an even lower 15.4 percent of recommended visits. The EPSDT screening visit completion rates for these children increased in both counties from FY9 1 to FY93 (to 25 percent and 18.6 percent, respectively) with a slightly greater increase evident in the MediPass counties. Children aged three to five years of age who must only have one visit during any 12-month period to comply with the AAP recommendations were slightly more likely to be in compliance compared to the younger children. Nevertheless, trends between county groups and over time were similar for children in the two age groups. In particular, the increase in the EPSDT visit completion rate was greatest among children in MediPass counties than among children in the comparison counties. Breaking the EPSDT visit completion rates out by eligibility category, we see that the proportionately greater increase among MediPass county

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[15] See Appendix B for a description of the computation of this compliance rate.

Table 4-17. Adjusted EPSDT Visit Completion Index for Beneficiaries Aged 2 Months to 5 Years by Age and Eligibility Group, Florida Waiver and Comparison Counties, FY91 and FY93

	MediPass Counties		Comparison Counties		Difference in Differences
	FY91	FY93	FY91	FY93	
All aged 2 months to 5 years	21.4	25.4	15.8	19.0	0.8
Age					
2 months to 2 years	21.0	25.0	15.4	18.6	0.8
3 to 5 years	26.4	30.1	20.2	23.3	0.6
Eligibility					
AFDC cash	21.2	22.7	15.9	17.3	-0.7
Non-cash	23.0	31.8	17.0	22.0	3.8
SOBRA	21.4	23.2	15.3	18.1	-1.0

beneficiaries compared to the control county beneficiaries was restricted to children in families enrolled under the non-cash eligibility category.

After holding constant demographic and Medicaid enrollment characteristics in multivariate probit analyses of compliance with the AAP health supervision periodicity schedule, we found a significant decline of 1.4 percentage points in compliance among children aged two months to two years in MediPass counties in FY93 (Table 4-18). We also find no significant change in the completion rate among children aged three to five years and a significant 0.8 percentage point decline among all preschoolers in MediPass counties. However, the declines were restricted to nonparticipants and part-time participants of the MediPass program. Children aged three to five years who participated in MediPass for their full Medicaid enrollment period were 4 percentage points more likely to have had their recommended screening visit in FY93. The younger preschoolers participating in MediPass for their full Medicaid enrollment period were no more or less likely than comparison children to have completed all EPSDT visits recommended by AAP.

5.2.2 Immunizations

Children typically receive common childhood immunizations during specific EPSDT screening visits. These immunizations can be billed separately through the Medicaid program. However, children also may have received their immunizations through other government-funded sources; these immunizations would not be reflected in the Medicaid claims database. In fact, very few immunizations were billed separately through Florida's Medicaid program in FY91. The number of immunization claims found in the FY93 files was substantially higher. But whether this increase represents an increase in the number of immunizations received by children or merely the number of immunizations billed separately through Medicaid is unknown.

With these caveats in mind, we present immunization completion rates for DTP, OPV, and MMR immunizations individually and combined for children aged two to 30 months in FY91 and FY93 (Table 4-19).[16] In FY91, only 7.4 percent of the recommended immunizations for children aged two to 30 months in the four waiver counties were billed separately through Medicaid. The percentage was an even lower 2 percent in the four comparison counties. The immunization completion rates varied little across the three vaccine types investigated.

Table 4-18. Estimated Coefficients for the Differences in the Probability of Compliance with the AAP Health Supervision Visit Schedule Among Medicaid Children Aged 2 Months to 5 Years in Florida Waiver and Comparison Counties from FY91 to FY93

	Probability of Compliance with the AAP Well-Child Visit Schedule[1]		
	2 - 30 Mos.	31 - 60 Mos.	2 - 60 Mos.
All beneficiaries in MediPass counties	-.014** (-6.15)	.010 (1.44)	-.008* (-2.77)
Delayed participation	-.013** (-5.45)	.044** (5.51)	-.000 (-0.11)
Full participation	.002 (0.56)	.040** (5.15)	.017** (4.96)
Disenrolled during year	-.012** (-3.90)	.020 (2.18)	-.003 (-0.72)
Nonparticipant	-.022** (-9.43)	-.094** (-12.15)	-.043** (-14.70)

[1] Adjusted for Ambulatory Diagnostic Groups (except for the preventive care group).
** p ≤ .001
* p ≤ .01

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[16] See Appendix B for a description of how these adjustments were made.

Table 4-19. Immunization Compliance Rates for Medicaid Beneficiaries Aged 2 to 30 Months by Vaccine Type and Eligibility Group in Florida Waiver and Comparison Counties, FY91 and FY93

	MediPass Counties		Comparison Counties		Difference in
	FY91	FY93	FY91	FY93	Differences
All aged 2-30 mos					
DTP	7.6	22.2	2.0	11.5	5.1
OPV	7.3	21.8	2.1	11.0	5.6
MMR'	6.5	20.4	1.9	10.4	5.4
Combined	7.4	21.9	2.0	11.2	5.3

Restricted to children aged 15 to 27 months.

From FY91 to FY93, the percent of recommended immunizations billed separately through Medicaid increased three-fold in the MediPass counties and more than five-fold in the comparison counties. Because of the larger base rate in the MediPass counties, the difference in differences over time show a 5.3 percentage point higher rate due to MediPass in the pilot counties. In FY93, 21.9 percent of recommended immunizations among children aged two to 30 months in MediPass counties were billed separately through Medicaid whereas only 11.2 percent were separately billed in the comparison counties.

The multivariate probit analysis of compliance with the AAP immunization schedules for the three vaccines investigated show no county-wide impact of the program (Table 4-20). In the equation that broke out the program effect by level of program participation, a significant 2 percentage point increase was found for full-period MediPass program participants and a 2 percentage point decrease was found for nonparticipants residing in the MediPass counties. Thus, most of the increase in the billing rate for immunizations was due to factors other than the MediPass program. However, for children with continuous coverage in the program, a small positive impact on immunization completion rates can be attributed to the program.

**Table 4-20. Estimated Coefficients for the Differences in the Probability
of Compliance with the AAP Childhood Immunization Schedule Among
Children Aged 2 to 30 Months in Florida Waiver and Comparison Counties
from FY91 to FY93**

	Probability of Compliance with the AAP Childhood Immunization Schedule
All beneficiaries in **MediPass** counties	-.006 (-2.32)
Delayed participation	-.004 (- 1.68)
Full participation	.020** (5.67)
Disenrolied during year	-.001 (-0.5 1)
Nonparticipant	-.020** (-9.78)

[1] Adjusted for Ambulatory Diagnostic Groups (except the preventive care group).
** $p \leq .001$
* $p \leq .01$

5.2.3 Pap Smears

We also looked at the rate at which women in child-bearing ages (19 to 39 years) received an annual pap smear. In Table 4-21, we show the percentage of all women with a pap smear during the year by eligibility group and the percentage of non-pregnant women in the AFDC cash and non-cash categories with a pap smear. Pap smears among this latter group of women are considered purely "preventative." Because pap smears are a standard part of prenatal care, they are not necessarily purely preventative for pregnant women.

Table 4-21. Percentage of Female Medicaid Beneficiaries Aged 19-39 Years with a Pap Smear by Eligibility Group, Florida Waiver and Comparison Counties, FY91 and FY93

	MediPass Counties		Comparison Counties		Difference in Difference
	FY91	FY93	FY91	FY93	
All women 19-39 yrs					
AFDC cash	17.8	22.8	11.6	17.6	-1.0
Non-cash	21.1	18.2	11.4	16.1	-7.6
SOBRA	33.4	43.3	19.9	32.9	-3.1
Non-pregnant women 19-39 years					
AFDC cash	12.4	15.7	7.5	12.0	-1.2
Non-cash	15.1	12.1	8.1	10.7	-5.6

A very small fraction of women, pregnant or otherwise, actually received a pap smear through the Medicaid program in either FY91 or FY93. The rates of pap smear use was higher in the MediPass counties in both FY91 and FY93. Although the rates increased slightly for cash assistance recipients in MediPass counties from FY91 to FY93, it fell for non-cash beneficiaries. The percentage of women with pap smears rose in both enrollment groups in the comparison counties. The difference in differences show less improvement in this measure of preventive care in the MediPass counties compared to the comparison counties.

The county-wide multivariate probit results confirm the descriptive finding of a small, relative set-back in the percentage of nonpregnant Medicaid women in child-bearing ages with pap smears under MediPass in FY93 (Table 4-22). However, the results of the equation that breaks out the effect by level of MediPass participation show the negative impact to be concentrated among nonparticipants. The program had no effect on the probability that beneficiaries who participated in MediPass for their full Medicaid enrollment period in FY93 received a pap smear during the year.

**Table 4-22. Estimated Coefficients for the Differences in the
Probability of an Annual Pap Smear Among Non-pregnant Female
Medicaid Beneficiaries Aged 19-39 Years of Age in Florida Waiver and
Comparison Counties from FY91 to FY93**

	Probability of an Annual Pap Smear[1]
All beneficiaries in MediPass counties	-.015** (-4.10)
Delayed participation	.007 (1.55)
Full participation	.003 (0.73)
Disenrolled during year	.015* (2.67)
Nonparticipant	-.043** (-11.80)

[1] Adjusted for Ambulatory Diagnostic Groups..
** p ≤ .001
* p ≤ .01

In summary, the MediPass program had little, if any, success in realizing increased use of preventive care. We found no meaningful program effects on EPSDT screening visits among preschoolers, immunization levels among infants and toddlers, or pap smears among nonpregnant women in child-bearing ages.

5.3 Patterns of Health Service Use

Above we described the MediPass program impact on the service use patterns of ambulatory cars in general, ER visits, hospitalizations for **ACSCs,** and selected preventive care services. We also looked for program impacts on the use of outpatient laboratory and radiology services, outpatient medications, and both non-delivery and delivery-related inpatient care.

53.1 Laboratory and Radiology Services

Among beneficiaries with some ambulatory care, the percentage with any laboratory and radiology services and the number of ambulatory care days with laboratory or radiology services per beneficiary with at least one such service are shown in Table 4-23. Adults were more likely than children to have had a laboratory or radiology service and they had more services per user compared to children. Nearly all pregnant women enrolled under the **SOBRA** eligibility category had some laboratory and radiology services and **SOBRA** users of these services had an average of six such services during the analysis years.

Table 4-23. Percentage of Medicaid Beneficiaries with at Least One Ambulatory Care Day with Laboratory and Radiology Services and the Number of Ambulatory Care Days with Laboratory or Radiology Services per Beneficiary with These Services by Eligibility Category, Florida Waiver and Comparison Counties, FY91 and FY93

| | MediPass Counties | | Comparison Counties | | Difference in |
	FY91	FY93	FY91	FY93	Differences
Percentage of Beneficiaries with Ambulatory Care Days with Laboratory or Radiology Services					
AFDC cash children	58.5	**58.6**	55.4	55.5	**0.0**
Non-cash children	58.7	**57.0**	55.7	50.7	3.3
SOBRA children	60.8	**58.7**	53.8	55.1	-3.4
AFDC cash adults	86.1	**84.8**	· 85.7	84.6	-0.2
Non-cash adults	85.9	**75.9**	83.4	79.1	-5.7
SOBRA adults	93.5	**94.7**	92.4	94.0	-0.4
Number of Ambulatory Care Days with Lab or Xray Services per Beneficiary with These Services					
AFDC cash children	2.5	2.4	**2.3**	2.3	**-0.1**
Non-cash children	2.6	2.4	**2.4**	2.3	-0.1
SOBRA children	2.8	2.4	**2.5**	2.4	-0.3
AFDC cash adults	4.5	4.5	**4.7**	4.4	0.3
Non-cash adult	4.2	3.7	**4.3**	3.9	-0.1
SOBRA adult	5.5	6.5	**5.7**	5.8	0.9

The percentage of Medicaid children with ambulatory laboratory and/or radiology services was slightly higher in the MediPass counties than in the comparison counties; the percentage of adults with any laboratory or radiology was similar across county groups. Little change in this measure was evident for any eligibility or county group from FY91 to FY93. The number of laboratory and radiology services per beneficiary with some services also was similar in the two county groups for both children and adults and was virtually unchanged over the study period.

The results of the multivariate analyses, shown in Table 4-24, confirm the absence of a program effect on the probability that children had any laboratory or radiology services. In the adult equation, full period MediPass participants had a significant negative coefficient but the estimated effect is a small 1.3 percentage point drop. In contrast to the descriptive tabular analysis, the multivariate results show a significant, negative impact on the number of ambulatory care days with laboratory and radiology services among child users and a significant, positive impact among adult users. However, the negative impact among children was concentrated among nonparticipants and part-year participants, and adults participating in MediPass for their full Medicaid enrollment period had the smallest estimated increase. Thus, the estimated program effect is not a strong or consistent one.

Table 4-24. Estimated Coefficients for the Differences in the Probability and Number of Ambulatory Care Days with Laboratory or Radiology Services Among Medicaid Beneficiaries with Ambulatory Care Days in Florida Waiver and Comparison Counties from FY91 to FY93

	Probability of Any Laboratory or Radiology Services[1]		Number of Ambulatory Care Days with Lab or Xray Services/User[1]	
	Children	Adults	Children	Adults
All beneficiaries in MediPass counties	.005 (0.93)	-.005 (-1.48)	-.029** (-4.14)	.087** (9.20)
Delayed participation	.009 (1.68)	-.006 (-1.45)	-.041** (-5.24)	.094** (8.36)
Full participation	.009 (1.55)	-.013* (-3.02)	-.010 (-1.19)	.033* (2.61)
Disenrolled during year	.009 (1.36)	-.007 (-1.34)	-.036** (-3.83)	.059** (4.16)
Nonparticipant	-.014 (-2.15)	.001 (0.32)	-.029* (-3.07)	.116** (10.61)

[1] Adjusted for Ambulatory Diagnostic Groups.
** p ≤ .001
* p ≤ .01

5.3.2 Medications

The percentage of Medicaid beneficiaries with any outpatient medications and the number of medications per beneficiary with these claims are shown in Table 4-25. Medicaid children in MediPass counties were slightly more likely to have had any medications and had slightly more medications per user on average in FY91. The use of medications increased slightly among Medicaid children in both county groups from FY91 to FY93. The increases were somewhat higher in the comparison counties, eliminating the small differences in pediatric medication use between the county groups.

Table 4-25. Percentage of Medicaid Beneficiaries with at Least One Medication and the Number of Medications per Beneficiary with Medications by Eligibility Group, Florida Waiver and Comparison Counties, FY91 and FY93

| | MediPass Counties | | Comparison Counties | | Difference in |
	FY91	FY93	FY91	FY93	Differences
Percentage of Beneficiaries with Medications					
AFDC cash children	42.3	43.2	40.3	40.3	0.9
Non-cash children	41.6	49.0	38.1	46.5	-1.0
SOBRA children	38.4	44.5	32.7	42.2	-3.4
AFDC cash adult	44.2	48.4	47.0	48.2	3.0
Non-cash adult	43.8	42.7	42.5	45.6	-4.2
SOBRA adult	46.3	55.2	43.3	54.3	-2.1
Number of Medication Claims Per Beneficiary with Medications					
AFDC cash children	5.4	5.5	5.0	5.4	-0.3
Non-cash children	5.7	5.9	5.1	5.7	-0.4
SOBRA children	5.9	6.1	5.4	6.0	-0.4
AFDC cash adult	8.2	8.1	7.7	7.6	0.0
Non-cash adult	7.6	7.2	6.9	6.8	-0.3
SOBRA adult	4.6	5.4	3.9	5.3	-0.6

For adults, the patterns of medication use differed over eligibility categories. However, like children, adult beneficiaries in MediPass and comparison counties had very similar medication use with increases from FY91 to FY93 being somewhat larger in the comparison counties. The greatest increases in use over time occurred among beneficiaries enrolled under SOBRA expansion categories.

In the multivariate analysis for children, we found a significant, negative county-level program effect on the probability of any medications and the number of medications conditional on some use (Table 4-26). However, in the equations that broke out the effect for children by their level of MediPass participation, the negative effect on medication use by Medicaid children in MediPass counties was shown to be primarily caused by children who had not participated in the program in FY93. The estimated program effect for children participating in MediPass for their full Medicaid enrollment during FY93 was an 11 percentage point increase in the probability of at least one medication claim and no effect on the number of claims among users.

Table 4-26. Estimated Coefficients for the Differences in the Probability and Number of Medications in Florida Waiver and Comparison Counties from FY91 to FY93

	Probability of Any Medications[1]		Number of Medications/User	
	Children	Adults	Children	Adults
All beneficiaries in MediPass counties	-.010* (-2.83)	.000 (0.05)	-.045** (-5.64)	-.007 (-0.57)
Delayed participation	.139** (33.42)	.206** (3 1.62)	-.015 (-1.73)	.027 (1.90)
Full participation	.110** (24.77)	.164** (22.47)	-.011 (-1.12)	.081** (5.19)
Disenrolled during year	.095** (18.42)	.187** (21.95)	-.060** (-5.54)	-.002 (-0.13)
Nonparticipant	-.253** (-67.57)	-.181** (-32.25)	-.164** (-14.91)	-.085** (-6.03)

[1] Not adjusted for Ambulatory Diagnostic Groups.
*Adjusted for Ambulatory Diagnostic Groups.
** p ≤ .001
* p ≤ .01

For adults, the county-level effects of the MediPass program estimated from the multivariate analysis were not statistically significant. Full-period MediPass participants had a significantly higher probability of any medication claims and a significantly higher number of medications per user. Conversely, nonparticipants in MediPass counties in FY93 had a significantly lower probability of any medication claims and a significantly lower number of medications per user.

5.3.3 Non-Delivery Hospital Stays

The percentage of Medicaid beneficiaries with at least one non-delivery hospital event, the number of non-delivery hospital events, and the total number of hospital days for non-delivery hospital stays are shown in Table 4-27 by eligibility and county group in FY91 and FY93. Approximately 3-4 percent of Medicaid beneficiaries in MediPass-eligible eligibility groups had at least one non-delivery hospital stay during the year. The MediPass program had a small dampening effect on non-delivery hospitalizations. For those eligibility categories in which the percentage of beneficiaries with non-delivery hospitalizations declined over time, they fell slightly more in the MediPass counties than in the comparison counties. For those eligibility categories in which the percentage of beneficiaries with non-delivery hospitalizations increased over time, they increased less in the MediPass counties than in the comparison counties.

Table 4-27. Percentage of Medicaid Beneficiaries with at Least One Non-Delivery Hospital Event, the Number of Non-Delivery Hospital Events, and the Total Number of Hospital Days for Non-Delivery Hospitalizations Per Beneficiary with Non-Delivery Hospital Events by Eligibility Group, Florida Waiver and Comparison Counties, FY91 and FY93

	MediPass Counties		Comparison Counties		Difference in Differences
	FY91	FY93	FY91	FY93	
Percentage of Beneficiaries with Non-Delivery-Related Hospital Events					
AFDC cash children	3.2	2.3	2.9	2.4	-0.4
Non-cash children	3.0	3.9	3.2	4.6	-0.5
SOBRA children	3.7	2.3	3.6	2.6	-0.4
AFDC cash adult	4.1	4.0	3.4	3.6	-0.3
Non-cash adult	3.6	3.9	3.3	3.9	-0.3
SOBRA adult	2.3	2.2	1.7	1.9	-0.3
Number of Non-Delivery-Related Hospital Events Per Beneficiary with Non-Delivery Hospitalizations					
AFDC cash children	1.2	1.2	1.2	1.2	0.0
Non-cash children	1.2	1.2	1.1	1.2	-0.1
SOBRA children	1.2	1.2	1.2	1.2	0.0
AFDC cash adult	1.2	1.2	1.2	1.2	0.0
Non-cash adult	1.2	1.3	1.2	1.4	-0.1
SOBRA adult	1.1	1.1	1.0	1.1	-0.1
Number of Hospital Days for Non-Delivery Hospital Events Per Beneficiary with Non-Delivery Hospitalizations					
AFDC cash children	7.5	7.1	6.7	5.3	1.0
Non-cash children	8.8	6.5	5.9	6.1	-2.5
SOBRA children	5.6	5.6	6.4	4.6	1.8
AFDC cash adult	7.3	6.9	6.4	6.4	-0.4
Non-cash adult	7.3	7.5	7.0	9.0	-1.8
SOBRA adult	5.9	5.5	4.1	4.7	-1.0

The average number of non-delivery hospitalizations per beneficiary with at least one such stay was 1.2 stays. This number varied little over eligibility category, county group, and time. A greater diversity was evident in the number of hospital days for non-delivery hospitalizations; patterns were hard to discern. Except for **SOBRA** children, the number of days was slightly higher in MediPass counties than in comparison counties in **FY91. This** pattern Was also evident in **FY93,** except among adults in families enrolled under the non-cash eligibility categories.

The multivariate analyses show a 0.3 percentage point decline in the probability of any non-delivery hospitalizations among children at the four-county level, but the decline is solely attributable to nonparticipants in the MediPass counties (Table 4-28). No statistically significant program effect was found in the equation for the probability of non-delivery hospitalizations among adults or in the regressions on the number of hospital days among children or adult beneficiaries hospitalized for non-delivery-related conditions in FY93.

Table 4-28. Estimated Coefficients for the Differences in the Probability of Any Non-Delivery-related Hospital Stays and the Number of Non-Delivery-related Hospital Days in Florida Waiver and Comparison Counties from FY91 to FY93

	Probability of Any Non-Delivery-related Hospital Stays		Number of Non-Delivery-related Hospital Days/User	
	Children	Adults	Children	Adults
All beneficiaries in MediPass counties	-.003** (-3.47)	-.003 (-1.93)	.038 (1.26)	.041 (0.91)
Delayed participation	.001 (1.22)	.009** (3.90)	.021 (0.61)	.012 (0.23)
Full participation	-.000 (-0.31)	.004 (1.58)	-.016 (-0.40)	.021 (0.37)
Disenrolled during year	.007** (4.27)	.015** (4.87)	.105 (2.51)	.118 (1.91)
Nonparticipant	-.013** (-12.75)	-.017** (-9.45)	.062 (1.59)	.051 (0.92)

[1] Not adjusted for Ambulatory Diagnostic Groups.
'Adjusted for Ambulatory Diagnostic Groups.
** p ≤ .001
* p ≤ .01

53.4 Delivery-related Hospital Stays

The percentage of female Medicaid beneficiaries who had delivery-related hospitalizations was slightly higher in the waiver counties than in the comparison counties in FY91 (Table 4-29). By FY93, the percentage of female beneficiaries with deliveries during the

year was comparable in the two county groups for ail age and eligibility categories. Slightly more than one third of female SOBRA beneficiaries aged 13 to 49 years delivered during the year.

Table 4-29. Percentage of Female Medicaid Beneficiaries with a Delivery-Related Hospital Event, and the Total Number of Hospital Days for Delivery-Related Hospitalizations by Age and Eligibility Group, Florida Waiver and Comparison Counties, FY91 and FY93

	MediPass Counties		Comparison Counties		Difference-in-Differences
	FY91	FY93	FY91	FY93	
Percentage of Beneficiaries with Delivery-Related Hospital Events					
Age					
13-20 years	19.4	16.5	17.3	16.7	-2.3
21-30 years	22.5	20.9	21.1	21.0	-1.5
3149 years	9.4	8.9	8.6	8.9	-0.8
Eligibility					
AFDC cash	12.2	10.8	12.8	10.7	0.7
Non-cash	15.8	7.0	12.9	8.3	-4.2
SOBRA	38.9	36.0	35.3	35.0	-2.6
Number of Delivery-related Hospital Days per Beneficiary with Delivery-related Hospitalizations					
Age					
13-20 years	2.8	2.6	2.8	2.5	0.1
21-30 years	2.7	2.8	2.8	2.5	0.4
3149 years	2.4	2.3	2.6	2.0	0.5
Eligibility					
AFDC cash	2.5	2.4	2.7	2.3	0.3
Non-cash	2.5	2.0	2.4	1.9	0.0
SOBRA	3.0	2.9	3.0	2.6	0.3

The number of delivery-related hospital days among women with deliveries was quite comparable in the MediPass and comparison counties in FY9 1. The average number of deliver-related hospitals days declined slightly from FY9 1 to FY93 in both county groups, with slightly greater declines in the comparison counties.

In the multivariate probit analysis of the probability of any delivery-related hospitalizations and the OLS regression of the number of delivery-related hospital days among

women with deliveries, we found no statistically significant effect of the MediPass program (Table 4-30).

Table 4-30. Estimated Coefficients for the Differences in the Probability of Any Delivery-related Hospital Stays and the Number of Delivery-related Hospital Days Among Females Aged 19-39 Years, Florida Waiver and Comparison Counties from FY91 to FY93

	Probability of Any Delivery-related Hospitalization	Number of Delivery-related Hospital Days
All beneficiaries in MediPass counties	-.004 (0.65)	.010 (0.75)
Delayed participation	.011 (1.81)	.035 (2.03)
Full participation	-.020 (-2.37)	-.018 (-0.78)
Disenrolled during year	-.009 (-1.06)	.001 (0.03)
Nonparticipant	.012 (1.88)	.006 (0.37)

[1] Not adjusted for Ambulatory Diagnostic Groups.
'Adjusted for Ambulatory Diagnostic Groups.
** $p \leq .001$
* $p \leq .01$

Tbe results of our analysis of service use patterns suggest that the greatest impact of the MediPass program was in the use of ambulatory care in general and in the setting of that care, with less care being delivered in ER settings. A smaller impact was found on the use of outpatient medications and laboratory and radiology services. Virtually no meaningful program effect was found for the use of preventive or inpatient hospital care, although a very small increase in EPSDT services among full-penod enrollees and a reduction in hospitalizations for ACSCs were attributable to the program.

5.4 Medicaid Expenditures

Finally, we investigated whether the changes in access and service use induced by the MediPass program increased or decreased Medicaid expenditures. Average expenditures per beneficiary are presented by eligibility category, county group, and year in Table 4-3 1. This table also presents the percentage changes in expenditures (in constant FY93 dollars) from FY91 to FY93 for both MediPass and comparison counties and the difference-in-difference estimates which indicate the impact of MediPass on expenditures.

Table 4-31. Average Medicaid Payments per Medicaid Beneficiary by Eligibility Category
Florida Waiver and Comparison Counties, FY91 and FY93

	Waiver Counties				Comparison Counties				
AFDC cash children	$ 845	$ 975	$ 537	-44.9	$ 712	$ 821	$ 475	-42.1	-2.8
Non-cash children	988	1,140	1,103	-3.2	819	945	1,060	12.2	-15.4
SOBRA children	1,043	1,203	545	-54.7	948	1,094	502	-54.1	-0.6
AFDC cash adults	1,382	1,595	1,056	-33.8	1,341	1,548	1,012	-34.6	0.8
Non-cash adults	1,323	1,526	748	-51.0	1,096	1,265	843	-33.4	-17.6
SOBRA adults	2,683	3,095	2,026	-34.5	2,415	2,786	1,839	-34.0	-0.5
All enrollees	1,144	1,320	827	-37.3	995	1,148	778	-32.2	-5.1

To control for the effect of fee increases, we computed a fee index for inflating the FY91 payment amounts to FY93 dollars. The fee index is based on a weighted set of common procedure codes billed for Medicaid children and adults. Based on this index, we found a 15.4 percent increase in Medicaid fees in Florida from FY91 to FY93.

MediPass decreased expenditures by 5.1 percentage points overall and for all but one of the eligibility categories (AFDC cash adults). The decrease was largest for non-cash adults who had a 17.6 percentage point decline in expenditures and for non-cash children who had a 15.4 percentage point decline in expenditures. For all other eligibility categories, except AFDC cash assistance children whose expenditures decreased by 2.8 percentage points, the change in expenditures was less than 1 percentage point.

Because the results in Table 4-3 1 do not control for other factors that may influence the impact of MediPass on expenditures, we also performed multivariate analyses on Medicaid expenditures as shown in Table 4-32. These results show that MediPass increases costs on the extensive margin by increasing the probability of having positive Medicaid expenditures, but lowers costs on the intensive margin by lowering average expenditures for those with positive expenditures.

At the overall four-county level, MediPass increased the probability of having positive expenditures by 17 percentage points $(t=52.08)$ for children and by 10 percentage points $(t=19.57)$ for adults. What is striking about these results for both children and adults is that the effects of MediPass on those who participated in MediPass are in stark contrast with those who never participated. Beneficiaries in MediPass counties in FY93 who never participated in MediPass were less likely to have had positive expenditures, whereas those who participated, at least for some period of time, were more likely to have had positive expenditures.

However, looking at the distribution of illness burden for Medicaid beneficiaries residing in the waiver counties who used services under MediPass only in FY93 to those who used services under FFS only, we found that those who never participated in MediPass were consistently healthier than MediPass participants. Therefore, extending the program to include those who never participated may not yield the same results as witnessed for those who participated.

The effect of MediPass on mean expenditures among beneficiaries with some expenditures was quite different. For both adults and children MediPass decreased expenditures at the four-county level. The effects of MediPass by level of MediPass participation are less straightforward. For children, MediPass decreased mean expenditures for those who delayed participation or who participated and then disenrolled. As one might expect, there was no change in expenditures for those who never participated. However, children who participated in MediPass for their entire Medicaid enrollment period also experienced no change in mean expenditures.

We observe a similar pattern for the adults. The effect of MediPass is larger among those who delayed participation or who participated and then disenrolled than those who were enrolled for their full Medicaid enrollment period. However, unlike for children, MediPass decreased

**Table 4-32. Estimated Coefficients for the Differences in the Probability of
Any Medicaid Payments and the Logarithm of Total Medicaid Payments by
Eligibility Group in Florida Waiver and Comparison Counties from FY91 to FY93**

	Probability of Any Medicaid Payments		Total Medicaid Payments	
	Children	Adults	Children	Adults
All beneficiaries in MediPass counties	.169** (52.08)	.096** (19.57)	-.106** (-12.18)	-.062** (4.42)
Delayed participation	.292** (52.15)	.309** (32.72)	-.226** (-23.73)	-.222** (-13.78)
Full participation	.286** (20.65)	.287** (18.30)	.015 (1.48)	-.061** (-3.42)
Disenrolled during year	.239** (24.47)	.259** (20.57)	-.159** (-14.19)	-.185** (-9.32)
Nonparticipant	-.259** (-73.63)	-.203** (-40.13)	.019 (1.67)	.122** (7.43)

[1] Not adjusted for Ambulatory Diagnostic Groups.
'Adjusted for Ambulatory Diagnostic Groups.
** p ≤ .001
* p ≤ .01

mean expenditures for all three groups of adult participants. Adults who did not participate in MediPass in FY93 experienced higher expenditures.

5.5 Counterfactual Expenditures under Medicaid FFS

To understand the net impact of MediPass on average expenditures, we used the two-part model to simulate a counter-factual scenario of what would have happened if the MediPass counties remained under a FFS system in FY93. The counterfactual estimates presented in Table 4-33 combine the impact of MediPass on the probability of having positive expenditures (the extensive margin) and the impact on mean expenditures conditional on having positive expenditures (intensive margin).

For children, we found that Medicaid expenditures would have been higher by 18 percent under FFS Medicaid in the waiver counties in FY93. Similarly, for adults, we found that expenditures would have been 15 percent higher under FFS Medicaid. Thus, the results suggest that savings were realized with the implementation of MediPass."

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[17] To check the validity of the multivariate equations, we applied the estimated coefficients to data for beneficiaries in the comparison counties in FY93. These data were used to estimate the coefficients of the prediction model. For adults, we found a 29 percent difference between the actual and predicted amounts, casting doubt on the adequacy of the prediction model. For children, the difference between the actual and predicted expenditure amounts was only 9 percent, suggesting a better tit for younger beneficiaries. Thus, we can have

Table 4-33. Counter-factual Medicaid Expenditure Simulations, Waiver Counties, FY93

	Actual Expenditures	Predicted Expenditures	Percent Difference
Children	$663	$780	+18%
Adults	$1,658	$1,904	+15%

6. Summary and Conclusion

6.1 Enrollment

Slightly more than one quarter of the MediPass-eligible Medicaid beneficiaries in the waiver counties voluntarily enrolled in HMOs for at least one month during FY93. These individuals included a disproportionate number of African Americans, AFDC cash assistance recipients, and full-year Medicaid enrollees. Because we did not have service use information on these beneficiaries for their HMO enrollment period, we eliminated them from the study.

Of the remaining MediPass-eligible beneficiaries almost 40 percent had no MediPass coverage during FY93, another 28 percent had FFS coverage before their MediPass enrollment began, and 12 percent disenrolled in MediPass during the year and subsequently had FFS coverage before the end of the year or their Medicaid enrollment period. Only 2 1 percent of MediPass-eligible Medicaid enrollees participated in MediPass for their full Medicaid enrollment period during FY93. Many of these delays and exemptions were related to lags in the MediPass and HMO enrollment process during which time beneficiaries received care under FFS Medicaid.

We also found that, compared to MediPass participants, beneficiaries with no MediPass coverage in the pilot waiver counties in FY93 were less likely to have had medical care for a set of diagnostic clusters ranging from time-limited minor acute conditions to unstable chronic conditions. The only exception was for pregnancy-related care, which was more common among nonparticipants than participants.

These differences between MediPass participants and nonparticipants suggest that we take care in interpreting the results of our evaluation. The program effect at the "four-county-level" is the sum of the direct effect of the program on those in the program and the indirect effect of having a certain group intentionally left out of the program for parts or all of the fiscal year. Because the nonparticipants are so different from the program participants in their medical care needs, increasing compliance or extending MediPass coverage to the nonparticipants and the partial year participants to the full year or their full Medicaid enrollment period may not yield the same level of benefits as those we measured for full-period participants.

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greater confidence that a savings was realized for Medicaid children in the waiver counties.

6.2   Service Use and Expenditures

With the above caveat in mind, we summarize below the impact of the MediPass program at two levels: (1) the group of MediPass counties as a whole, and (2) full-period MediPass participants in the counties offering the program. A summary of the results is provided in Table 4-34 and discussed below.

6.2.1 Four-County Impact

What these estimated impacts tell us about the success of the MediPass program in meeting the four objectives listed above are discussed in turn below.

Access to Primary Health Care. We found that access to primary health care was not compromised under Florida's MediPass program compared to **FFS** Medicaid and may have even improved under the program. Children were more likely to have ambulatory care and both children and adults had fewer ER visits and fewer hospitalizations for **ACSCs** in the pilot waiver counties during FY93. However, all these effects were fairly small. Furthermore, the extent to which ER visits declined is overstated because our figures do not include visits that were made, but just not reimbursed through MediPass or Medicaid FFS.

Preventive Care Use. We found no evidence that the MediPass program improved use of preventive care in the waiver counties in **FY93.** We found no meaningful program effects on EPSDT screening visits among preschoolers, immunization levels among infants and toddlers, or pap smears among nonpregnant women in child-bearing ages. The great promise of the program to increase the use of preventive care by providing beneficiaries a personal doctor and a medical home was not realized in **FY93.**

Patterns of Service Use. The MediPass program had only a small impact on the patterns of service use among children enrolled in Medicaid and even less of an impact on service patterns among adult beneficiaries. Children in MediPass counties in **FY93** were slightly more likely to have had any ambulatory care and slightly less likely to have had any inpatient care or outpatient medications. Among children with ambulatory care, there were fewer days of care, ER visits, and laboratory and radiology services. **In** contrast to children, adults in the waiver counties were no more likely to have had ambulatory care or non-delivery-related inpatient stays in **FY93.** In addition, adults with ambulatory care, had slightly more days of care and more laboratory and radiology services. However, all of these impacts were small and many were concentrated among nonparticipants of the program in the waiver counties.

Health Care Expenditures. The MediPass program resulted in a greater percentage of children and adults with Medicaid payments during the year and a lower average expenditure total among beneficiaries with payments. In a simulation of what the expenditures would have been under FFS Medicaid in the four waiver counties, we found cost-savings in the range of **9** to 18 percent among child beneficiaries on average. We also found cost-savings for adult beneficiaries, but the margin of error in the model we used could account for the total difference.

**Table 4-34. Summary Results of the Impact of the MediPass Program
on Selected Measures, Waiver Counties, FY93**

	Four-County Result		Phase-in Program Result	
	Children	Adult	Children	Adult
Improving Access to Primary Care				
Any ambulatory days of care'	+	0	+	+
Number of ambulatory care days among users[2]		+	+	+
Any ER visits[2]		–		–
Number of days with ER visits among users[2]		–		–
Any hospitalizations for ACSCs[1]	–	–	–	–
Promoting Preventive Care				
Compliance with well-child schedule[2]		n.a.	+	n.a.
Compliance with immunization schedule'	0	n.a.	+	n.a.
Compliance with annual pap smears'	n.a.		n.a.	0
Changing Patterns of Service Use				
Any ambulatory care laboratory or radiology[2]	0	0	0	
Number of days with lab/xray among users[2]		+	0	+
Any claims for ambulatory care medications'		0	+	+
Number of medication claims among users[2]		0	0	+
Any nondelivery hospital stays'		0	0	0
Number of nondelivery hospital days among users[2]	0	0	0	0
Number of delivery days among users[2]	n.a.	0	n.a.	0
Controlling Medicaid Expenditures				
Any Medicaid payments'	+	+	+	+
Total Medicaid payments among users[2]	–		0	
Counterfactual expenditures	–		n.a	n.a.

[1] Estimated without controlling for Ambulatory Diagnostic Groups.
[2] Estimated controlling for Ambulatory Diagnostic Groups.
0 no significant effect
+ increased use or expenditures
• decreased use or expenditures

6.2.2 **Full Participant Impact**

The full participant-level results from the multivariate analyses are summarized in the last two columns of Table **4-34;** the significance and direction of the coefficients for full-period participants are shown. These results must be interpreted with care because of evidence of selective participation that we could not fully control in many of the estimated equations. **In** particular, we found MediPass participants had greater health care needs than nonparticipants. Therefore, program effects based on full-period participants may overstate the effect that you could get from covering all beneficiaries under MediPass.

Access to Primary Health Care. Our analysis shows that the MediPass program improved access to care among Medicaid children and adults participating in the program. Program participation increased the probability of any ambulatory care and the number of ambulatory care days among those with some care. In addition, emergency room visits and hospitalizations for ACSCs were significantly reduced among program participants.

Preventive Care Use. Our analysis also shows a significant, positive impact of the MediPass program on the use of preventive care among young children. Preschoolers participating in the program were more likely to be in compliance with national standards for well-child check-ups. However, the rates of compliance remained exceedingly low suggesting that the program did not substantially improve the use of preventive care among participants. In addition, because of the very low completion rates computed from the claims data, we believe that the tile may not be capturing the majority of immunizations received by Medicaid children.

Patterns of Service Use. As mentioned above, the increased ambulatory care use found among children participating in the MediPass program in **FY93** appears to have resulted in significantly fewer ER visits and hospitalizations for **ACSCs.** In addition, children and adults fully participating in MediPass were more likely to have had outpatient medications. However, we found no significant reduction in the probability of any non-delivery hospitalizations among children and adults participating in the program.

Health Care Expenditures. The MediPass program resulted in a greater percentage of child and adult participants with Medicaid payments during the year, and a lower average expenditure total among adult participants with payments. Children with payments had the same level of payments regardless of their participation level.

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Chapter 5: The New Mexico Primary Care Network

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1.   Introduction

The New Mexico Primary Care Network (PCN) provides a unique opportunity to study the impact of a mandatory primary care case management (PCCM) model in a predominantly rural State, among Supplemental Security Income **(SSI)** recipients and other aged and disabled Medicaid beneficiaries, and among two minority populations. Most early generation managed care models were in urban settings where Medicaid populations are concentrated and providers are more numerous. Therefore, little data exists on the success of these programs in rural areas. In addition, there is a dearth of information on how managed care impacts SSI-related Medicaid beneficiaries. The early Medicaid managed care programs typically were restricted to recipients of Aid to Families with Dependent Children (AFDC) and other AFDC-related beneficiaries. New Mexico's PCN program is open to individuals enrolled under AFDC- and SSI-related eligibility groups and most poverty-related expansion beneficiaries (i.e., pregnant women and young children in poor and near-poor families). Finally, the New Mexico PCN program provides an opportunity to study the impact of a PCCM model for Native American and Hispanic beneficiaries. Approximately one half of all New Mexico Medicaid beneficiaries eligible for the PCN program in 1993 were Hispanic and another 11 percent were Native American.

To evaluate the PCN Section 1915(b) waiver in New Mexico, we used a **quasi-**experimental research design with both **pre/post** and contemporaneous comparisons of Medicaid claims data. The pre-period is calendar year 1990, the year just prior to the implementation of PCN, and the post-period is calendar year 1993. The experimental group consists of all Medicaid beneficiaries enrolled under PCN eligibility categories who resided in nonmetropolitan counties that implemented the program prior to 1993. The comparison group consists of similar Medicaid beneficiaries in nonmetropolitan counties that implemented the program after 1993.

We investigated PCN enrollment and disenrollment decisions and the success of the PCN program in achieving the following four goals: (1) to improve access to primary health care; (2) to promote the use of preventive care services; (3) to change patterns of service utilization; and (4) to control health care expenditures. We used several health service use measures from the claims data to provide evidence of the program's success in meeting each of these goals. We compared the levels of and the changes over time in these measures between the experimental and comparison groups. In addition, we used multivariate econometric techniques to control for demographic characteristics, Medicaid enrollment duration and category, and other selected factors independently influencing health service use. Separate analyses were performed for children (under 18 years of age), adults enrolled in Medicaid under the SSI-related eligibility criteria, and adults enrolled under AFDC-related and other eligibility criteria.

In Section 2 below, we describe the study population. We list the research questions to be investigated and hypotheses to be tested in section 3. In section 4, we describe our estimation methods and list the dependent and independent variables for the analysis. We present the results of the descriptive and multivariate analyses in section 5, In section 6, we summarize the results.

2. Background

2.1 The PCN Program

As noted above, New Mexico's PCN is a mandatory PCCM model of managed care. Initially implemented in three counties in August 1991, by the middle of 1994, the program was operational in 26 of the 33 counties in New Mexico. Before a county can participate in PCN, it has to have at least three primary care providers (PCPs) within 25 miles of beneficiaries' residences among whom Medicaid enrollees can choose. Providers eligible to become PCPs include general practitioners, family practitioners, internists, pediatricians, obstetrician/ gynecologists, and clinics with a full-time physician in one of these specialties. Rural health clinics staffed by nurse practitioners or physicians' assistants can also participate, and specialists can be designated as PCPs for their patients with specialized medical needs if th?y coordinate care for these patier.ts. Furthermore, Native Americans can choose the Indian Health Service (MS) as their PCP.

Medicaid beneficiaries who are required to participate in the PCN program include AFDC and SSI recipients, beneficiaries meeting the categorical requirements of these programs and other state-specific financial criteria, children in two-parent families meeting the State's AFDC financial standards (Ribicoff children), and Medicaid beneficiaries who are eligible under poverty-related expansion categories (pregnant women and young children). Dual Medicare-Medicaid recipients, the institutionalized, foster care children, and those enrolled in other managed care programs are automatically exempt.' Although the program is mandatory for the eligibility groups listed above, exemptions from PCN enrollment are granted for "good cause," which includes lack of providers in an area or special medical needs (such as advanced illness which requires continuation of an established relationship with a specialist) (RTI, 1997).

All PCN enrollees must have a designated PCP and primary pharmacy. PCN enrollees can choose their PCP and primary pharmacy from a list of participating physicians, clinics, and pharmacies. A PCP and a primary pharmacy are assigned to PCN enrollees who fail to choose. The assignment is made by an automated program that randomly assigns a provider and pharmacy based on the patient's age, gender, place of residence, and the provider's available number of "slots." Each physician is allowed up to 1,500 slots, and nonphysician providers are allowed up to 300 slots. However, in many counties, as many as 20 to 25 percent of PCPs have asked for only enough slots to care for Medicaid patients already in their practice (RTI, 1997). The automated program attempts to assign a provider/pharmacy within the enrollee's county, but in many cases, a PCP or pharmacy in an adjacent county is assigned. Assignments were originally locked in for 60 days but are currently locked in for six months.

The PCP receives a $2.00 case management fee per member per month to cover the costs of coordinating care. Medicaid services covered under the PCP agreement include primary care services and referrals for other PCN services. A PCP referral is required for specialist services,

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[1] There were no Medicaid beneficiaries in other managed care programs during the analysis years.

including urgent care, hospital inpatient and outpatient services, ambulatory surgery, and rural health clinic services. The following services are exempt from PCN and may be provided by any qualified provider: eyeglasses and related services; dental services; psychiatric and psychological services; obstetrical services; family planning services; Early and Periodic Screening, Diagnostic, and Treatment (EPSDT) screenings and enhanced services; durable medical equipment; laboratory and radiology services; nursing home and home health services; services provided by MS; emergency room (ER) services; podiatrist services; and hospital visits by physicians. Pharmacy services must be provided by the primary pharmacy, except when there is a medical emergency, when the primary pharmacy does not have the drug in stock, or when the enrollee is more than 60 miles from the primary pharmacy. All services and medications are paid on a fee-for-service basis.

2.2 The Study Population

The study population came from the universe of PCN-eligible individuals ever enrolled in the New Mexico Medicaid program in 1990 and 1993. We excluded beneficiaries whose primary enrollment categories (the eligibility categories under which they were enrolled for the greatest number of months during the year) were not PCN eligibility categories. We then separated the study population into three groups based on their county of residence: (1) beneficiaries residing in counties that implemented the PCN program prior to 1993; (2) beneficiaries residing in counties that implemented the program after 1993; and (3) beneficiaries residing in Santa Fe, Dona Ana, Bemalillo, or Luna counties. Beneficiaries in the first group were our target PCN study population and those in the second group comprised the comparison population. We deleted the third group of beneficiaries from the analysis because they either resided in large metropolitan counties and the focus of this study is rural counties or, in the case of Luna County beneficiaries, because the PCN program was implemented during 1993, the analysis year.[2] Furthermore, because we identified the PCN and comparison populations by the county in which they resided, we also excluded persons who moved from one county to another during the analysis years. These latter persons comprised about 4 percent of New Mexico Medicaid beneficiaries each year.

We further classified Medicaid beneficiaries in the PCN group of counties by the extent of their PCN participation. We flagged beneficiaries who participated in PCN for their full Medicaid enrollment period during the year as full-period participants. For beneficiaries who participated in PCN for only part of their Medicaid enrollment period during the year, we flagged whether they were enrolled in Medicaid fee-for-service (FFS) prior to participating in PCN (late or delayed beneficiaries) or whether they had disenrolled from PCN prior to disenrolling from Medicaid or the end of the year, whichever came first.

The results of this classification are shown in Table S-l. There were 197,593 Medicaid beneficiaries in the eligibility groups open to PCN participation in 1993. Approximately 41.4 percent lived in counties excluded from the study. Just under one third (3 1.5 percent) lived in

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[2] Service use data comparable to those in the descriptive tables for the analysis counties were prepared for the excluded counties and are available from the authors.

Table 5-l. PCN Implementation Dates, Medicaid Enrollment, and PCN Participation by County and Study Group, 1993

	PCN Implementation Date	Number of Medicaid Beneficiaries	Not Enrolled	Full Period	Partial Period
PCN Counties	–	62,192	32.8%	30.6%	36.6%
Chaves	8/91	8,849	35.0%	32.1%	32.8%
Colfax	8/91	1,433	30.6%	31.7%	37.8%
DeBaca	11/91	228	50.9%	11.4%	37.7%
Eddy	11/91	6,293	31.6%	34.2%	34.2%
Guadalupe	11/91	897	34.4%	22.7%	42.8%
Harding	11/91	62	66.1%	24.2%	9.7%
Lea	11/91	7,214	30.7%	27.6%	41.6%
Lincoln	11/91	1,343	40.1%	19.1%	40.9%
Los Alamos	6/92	123	53.7%	13.0%	33.3%
Mora	11/91	826	45.8%	30.7%	23.5%
Quay	6/92	1,744	31.9%	30.9%	37.2%
Rio Arriba	11/91	5,974	33.3%	26.3%	40.3%
Sandoval	6/92	6,087	33.1%	31.0%	35.9%
San Miguel	11/91	5,402	31.3%	38.8%	29.9%
Socorro	11/91	2,975	27.6%	38.2%	34.3%
Taos	11/91	3,667	35.3%	22.1%	42.7%
Torrance	6/92	1,635	30.3%	35.2%	34.5%
Union	8/91	412	27.7%	16.3%	56.1%
Valencia	8/91	7,028	31.9%	30.3%	37.8%
Control Counties	–	53,497	98.5%	0.4%	1.1%
Catron	7/95	217	96.8%	0.0%	3.2%
Curry	0/0	5,686	98.1%	0.6%	1.3%
Grant	7/95	4,205	98.3%	0.2%	1.4%
Hidalgo	7/95	859	98.8%	0.5%	0.7%
McKinley	4/94	17,237	98.8%	0.3%	0.9%
Otero	7/95	4,995	98.1%	0.4%	1.5%
Roosevelt	7/95	2,353	98.5%	0.6%	0.9%
San Juan	4/94	12,891	99.0%	0.4%	0.7%
Sierra	7/95	1,204	95.8%	1.2%	2.9%
Cibola	4/94	3,850	97.9%	1.0%	1.2%
Excluded Counties	–	81,877	31.8%	28.4%	39.8%
Bernalillo	2/92	47,588	31.3%	31.6%	37.1%
Dona Ana	2/92	23,933	30.8%	26.3%	42.9%
Luna	?/?	3,897	33.7%	1.1%	65.2%
Santa Fe	2/92	6,459	37.7%	29.0%	33.3%

other counties that implemented the program between August 1991 and July 1992. The remaining 27.1 percent lived in counties that implemented the program after 1993.

Among Medicaid beneficiaries in the PCN counties in 1993, about one third was never enrolled in the program while they were enrolled in Medicaid, another third was enrolled for their full Medicaid enrollment period, and the final third was enrolled for only part of their Medicaid enrollment period. Among those who participated in PCN, almost one quarter (24.1 percent) disenrolled from the PCN program before the end of their Medicaid enrollment period in 1993. Among the large urban counties excluded from the study, all of which implemented the program around February 1992, we see a similar distribution of beneficiaries across the PCN participation categories. Slightly more of the PCN participants in the excluded counties (28.9 percent) disenrolled from PCN before the end of their Medicaid enrollment period. A small percentage of Medicaid beneficiaries in the control counties (l-4 percent) had some PCN enrollment as well.[3]

2.2.1 Characteristics of the Study Population

Selected demographic and enrollment characteristics of Medicaid beneficiaries in the two groups of counties in 1990 and 1993 are shown in Table 5-2. In both years, the two groups of beneficiaries had fairly similar distributions over the age and eligibility categories. On the other hand, beneficiaries in the two county groups differed markedly in their distributions over the race/ethnicity categories and in the population size of their counties of residence. The PCN counties had proportionally more whites and Hispanics and relatively fewer Native Americans than the control counties; the control counties include McKinley and San Juan Counties which contain the Navajo Reservation. However, the PCN counties on average were less populated than the control counties.

From 1990 to 1993, the number of Medicaid beneficiaries in all PCN-eligible enrollment categories grew 63.6 percent. Because of the Federally mandated Medicaid expansions in the early 1990s, this growth was disproportionately concentrated among pregnant women and children. For the State as a whole, the percentage of Medicaid beneficiaries eligible for the PCN program who were in the "other women and children" eligibility category rose from 19.8 percent in 1990 to 27 percent in 1993.[4] The percentages of the beneficiary population who were aged three to five years and six to 17 years also rose in both county groups from 1990 to 1993.

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[3] Medicaid beneficiaries with residences in more than one county during the year were deleted from the file. Why beneficiaries with some PCN participation are found in the control counties is unknown.

[4] In January 19% the expansion categories in New Mexico included pregnant women and children up to age four living in families with incomes up to 100 percent of the Federal poverty level (FPL). In April 1990, the income cut-off was extended to 133 percent of the FPL for pregnant women and children up to age six. By July 1991, pregnant women and infants (under one year of age) in families with incomes up to 185 percent of the FPL, children aged from one to six years with incomes up to 133 percent of the FPL, and children aged seven to eight years with incomes up to 100 percent of the FPL were eligible for Medicaid under the expansions. The latter age cut-off rose to nine years in July 1992 and ten years in July 1993.

Table 5-2. Percentage Distribution of Demographic and Medicaid Enrollment Characteristics Among Medicaid Beneficiaries by County Group, New Mexico 1990 and 1993

	PCN Counties		Control Counties	
	1990	1993	1990	1993
Number of beneficiaries	39,609	62,192	32,861	53,497
Age Group				
0-2 years	18.6	17.3	17.5	16.7
3-5 years	14.3	16.6	14.4	17.5
6-17 years	25.7	29.0	28.5	30.7
18-24 years	6.8	7.1	6.9	6.7
25-54 years	19.3	19.1	19.5	18.5
55-64 years	3.7	3.0	3.6	3.1
65+ years	11.5	7.8	9.6	6.7
Race/Ethnicity				
White	32.4	30.4	27.0	23.2
Hispanic	46.2	52.3	27.8	30.3
Native American	10.5	7.2	26.8	20.7
Other	10.9	10.0	18.4	25.9
Residence				
Nonrnetropolitan, urbanized	43.6	47.3	82.2	83.5
Nonmetropolitan, less urbanized	50.4	46.9	17.5	16.1
Nonmetropoiitw, thinly populated	6.0	5.9	0.4	0.4
Eligibility Category				
AFDC recipients and related groups	56.4	53.6	63.7	57.5
SSI recipients and related groups	24.6	20.6	21.3	17.8
Other women and children	19.0	25.8	15.1	24.7
Enrollment Duration				
Full year	51.1	53.4	47.6	49.2
Part year	48.9	46.6	52.4	50.8

The percentage of the beneficiary population who were Hispanic increased from 1990 to 1993. The largest increase was in the PCN counties (from 46.2 percent to 52.3 percent). A small shift in the population to urban areas also occurred during this period.

2.2.2 Illness Burden Among the Study Population

To determine whether the populations of the different county groups differed in their health care needs, we computed illness burden measures using the Ambulatory Care Group (ACG) system developed at Johns Hopkins University (Weiner et al., 1991). This system places each of the approximately 5,000 common ICD-9-CM[5] diagnosis codes into one of 34 clusters based on its expected relationship to health care resource use. These clusters called Ambulatory Diagnostic Groups (ADGs) are assigned to individuals based on the primary and secondary diagnoses on claims for inpatient and outpatient provider encounter? made over a defined period of time (e.g., a year). Over this period, a person may have had claims for a variety of conditions and therefore could be assigned several different ADGs.

The percentages of the study population with selected ADGs are shown in Table 5-3 separately for children, AFDC and other non-SSI adults, and SSI adults by county group and year. Because we do not have information on medical conditions among non-users, the percentages are based on beneficiaries with claims. The results show a slight differential distribution of illness burden over users of services in the two county groups, with beneficiaries in the PCN counties showing sightly greater burden.

Children and AFDC and other non-SSI adults in PCN counties were equally or slightly more likely to have had care in all of these ADG clusters in 1990 and nearly all in 1993 compared to beneficiaries in control counties. SSI adults in PCN counties were also slightly more likely to have care in most ADG clusters compared to SSI adults in control counties. Notable exceptions were major time-limited (acute) conditions, stable and unstable chronic conditions requiring generalist care, and major injuries/adverse effects for which SSI adults in PCN counties were slightly less likely to have care compared to SSI adults in control counties.

In both rCN and control counties, the percentages of beneficiaries with claims rose in nearly all ADG categories from 1990 to 1993. For all three eligibility groups, control counties had greater increases in the percentage of beneficiaries with claims for stable chronic conditions requiring specialty care compared to PCN counties. In addition, by 1993, SSI adults in control counties were more likely to have had care for minor acute conditions compared to SSI adults in PCN counties.

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[5] *International Classification of Diseases, Ninth Revision, Clinical Modification.*

[6] Diagnoses on laboratory, radiology, and pharmacy claim are excluded to avoid "rule-out" diagnoses providers assign to patients before a definitive diagnosis is made.

Table 5-3. Percentage of Beneficiaries with Selected Ambulatory Diagnostic Group (ADG) Clusters by Eligibility Group in PCN and Control Counties. 1990 and 1993

Children					
Time-limited, minor (1,2)	61.4	73.3	50.6	**69.5**	-7.0
Time-limited, major (3.4)	8.2	10.0	6.9	8.1	0.6
Allergies (5)	4.8	6.7	3.1	4.4	0.6
Asthma (6)	3.9	6.5	3.1	4.3	1.4
Likely to recur (7,8,9)	41.5	55.6	33.5	46.6	1.0
Chronic medical, stable (10)	5.9	7.2	7.4	7.0	1.7
Chronic medical, unstable (11)	2.3	2.4	2.0	2.5	-0.4
Chronic specialty, stable (12,13,14)	2.0	3.2	1.7	4.3	-1.4
Chronic specialty, unstable (16,17,18)	0.7	0.8	0.6	0.7	1.1
Dermatologic (20)	3.5	4.2	2.2	3.2	-0.3
Injuries/adverse effects, minor (21)	II.0	15.3	9.1	13.2	0.2
Injuries/adverse effects, major (22)	8.6	10.1	6.7	9.6	-1.4
Psychosocial, acute, minor (23)	1.1	1.8	0.9	1.4	0.2
Psychosocial, recurrent or persistent, stable (24)	2.7	5.0	1.9	4.4	-0.2
Psychosocial, recurrent or persistent, unstable (25)	0.4	0.5	0.2	0.5	-0.2
Malignancy (32)	0.2	0.2	0.2	0.2	0.0
Pregnancy (33)	9.6	1.0	0.6	0.7	0.3

AFDC Adults	RFP Sample 1996		Control Sample 1995		Diff in percents
Time-limited, minor (1,2)	42.6	51.4	34.3	**49.7**	-6.6
Time-limited, major (3.4)	14.6	16.1	12.4	14.2	-0.3
Allergies (5)	5.3	7.1	4.0	5.6	0.2
Asthma (6)	1.9	3.6	1.0	2.2	0.5
Likely to recur (7,8,9)	40.0	48.7	29.9	38.7	-0.1
Chronic medical, stable (10)	19.9	22.6	15.1	17.6	0.2
Chronic medical, unstable (11)	6.3	7.7	4.7	5.9	0.2
Chronic specialty, stable (12,13,14)	4.1	4.9	2.7	6.9	-3.4
Chronic specialty, unstable (16,17,18)	1.3	1.6	0.6	0.8	0.1
Dermatologic (20)	4.8	5.6	3.9	4.2	0.5
Injuries/adverse effects. minor (21)	14.2	18.8	10.1	15.6	-0.9
Injuries/adverse effects, major (22)	9.8	12.3	7.4	10.1	-0.2
Psychosocial, acute, minor (23)	3.1	3.4	1.7	2.7	-0.7
Psychosocial, recurrent or persistent, stable (24)	10.3	12.0	6.0	7.2	0.5
Psychosocial, recurrent or persistent, unstable (25)	2.6	3.3	1.6	2.6	-0.3
Malignancy (32)	0.7	0.8	0.7	0.9	-0.1
Pregnancy (33)	18.6	20.0	18.0	22.5	-3.1

SSI Adults

Time-limited, minor (1,2)	19.8	27.7	19.3	31.1	-3.9
Time-limited, major (3,4)	9.6	11.7	11.1	12.5	0.7
Allergies (5)	2.4	3.3	1.8	3.7	-1.0
Asthma (6)	1.6	2.9	1.3	1.9	0.7
Likely to recur (7,8,9)	18.9	26.4	18.0	24.1	1.4
Chronic medical, stable (10)	21.0	28.4	21.4	29.2	-0.4
Chronic medical, unstable (11)	14.2	17.4	16.2	18.8	0.6
Chronic specialty, stable (12,13,14)	4.4	5.8	4.0	8.4	-3.0
Chronic specialty, unstable (16,17,18)	0.9	1.5	0.8	1.0	0.4
Dermatologic (20)	3.8	4.7	2.3	3.5	-0.3
Injuries/adverse effects, minor (21)	6.9	10.5	5.5	9.4	-0.3
Injuries/adverse effects, major (22)	6.3	9.0	8.0	9.7	1.0
Psychosocial, acute, minor (23)	2.0	3.3	1.7	3.0	0.0
Psychosocial, recurrent or persistent, stable (24)	10.2	11.9	6.0	8.8	-1.1
Psychosocial, recurrent or persistent, unstable (25)	9.7	11.9	6.7	8.4	0.5
Malignancy (32)	1.7	2.3	2.2	2.1	0.7
Pregnancy (33)	0.4	0.8	0.4	0.8	0.0

2.3   PCN Enrollment and Disenrollment

In the 22 counties that had fully implemented the PCN program by 1993, just two thirds of eligible Medicaid beneficiaries participated in the program that year and only one third was enrolled for their full 1993 Medicaid enrollment period. One quarter of all PCN participants in the 22 counties had disenrolled from PCN before the **end of their Medicaid enrollment period.**

A significant number of exemptions were granted among eligible beneficiaries for "good cause," which included special medical needs and lack of providers in an area. Many other exemptions were due to administrative failures (University of New Mexico, 1995; RTI, 1997). During the New Mexico site visit for this project, for example, the State attributed the high rate of exemptions to staff shortages, stating that they did not have the capacity to resolve problems in PCP assignments (RTI, 1997). Furthermore, the State had not yet developed an effective mechanism for identifying and enrolling newborns.

The extent to which non-participating eligible Medicaid beneficiaries in PCN counties differed systematically in their health care needs from program participants could affect the estimated impact of the program on service use and costs. Therefore, we compared the relative distributions of various demographic characteristics, Medicaid enrollment characteristics, and ADG clusters among Medicaid beneficiaries in PCN counties by their level of PCN participation. We also used multivariate analysis to determine the importance of these factors in beneficiaries' enrollment and disenrollment decisions.

2.3.1   Characteristics of PCN Participants and Eligible Nonparticipants

In Table 5-4, we show the demographic and Medicaid enrollment characteristics of Medicaid beneficiaries in the PCN counties by their PCN participation category. Beneficiaries aged O-2 years were more likely to have participated for only part of their Medicaid enrollment or to not be enrolled at all in 1993 compared to the other age groups. This is consistent with the case study finding of problems enrolling infants from birth. The elderly (65+) and individuals enrolled under SSI-related categories (which include the elderly) were also less likely to have participated in the PCN program. Presumably, they were exempt because of existing relationships with non-PCN physicians.

Among the **race/ethnicity** groups, whites in PCN counties were relatively less likely to be participating in the PCN program while Hispanics in the PCN counties were relatively more likely to be participating. Whether the individual resided in a more or less populated county did not affect the likelihood of participating or disenrolling from the PCN program. Finally, individuals enrolled in Medicaid for only part of the year were less likely to have participated in the PCN program during their entire Medicaid enrollment period than individuals enrolled in Medicaid for the full year. This latter result reflects the administrative delays in enrolling individuals in the PCN program, as well as the exemption for pregnant women.

Table 5-4. Percentage Distribution of Demographic and Medicaid Enrollment Characteristics Among Medicaid Beneficiaries by PCN Participation, New Mexico 1993

	Non-participant	Delayed Participation	Full Participation	Disenrolled During Year
Number of beneficiaries	20,403	12,708	19,027	10,054
Percent of total	32.8	20.4	30.6	16.2
Age Group				
0-2 years	21.8	23.7	9.2	15.7
3-5 years	9.3	19.2	19.6	22.5
6-17 years	18.4	31.2	36.5	33.6
18-24 years	6.1	7.2	7.4	8.5
25-54 years	18.7	16.5	22.5	16.8
55-64 years	3.5	1.9	4.0	1.7
65+ years	22.2	0.4	0.9	1.2
Race/Ethnicity				
White	39.4	27.3	25.9	24.7
Hispanic	39.8	58.6	58.2	58.8
Native American	7.8	6.3	7.3	7.2
Other	13.0	7.8	8.7	9.3
Residence				
Nonmetropolitan, urbanized	46.8	47.9	47.9	46.1
Nonmetropolitan, less urbanized	46.7	47.9	46.4	46.9
Nonmetropolitan, thinly populated	6.6	4.2	5.6	7.0
Eligibility Category				
AFDC recipients and related groups	35.1	58.0	64.6	64.9
SSI recipients and related groups	38.3	7.8	16.1	9.2
Other women and children	26.6	34.2	19.4	25.9
Enrollment Duration				
Full year	34.2	46.0	75.5	59.8
Part year	65.8	54.0	24.5	40.2

Table 5-5. Percentage of Beneficiaries with Selected Ambulatory Diagnostic Group (ADG) Clusters Among Beneficiaries with Medicaid Payments by Eligibility Group and PCN Participation, 1993

	Nonparticipant	Delayed Participation	Full Participation	Disenrolled
Children				
Time-limited, minor (1.2)	66.5	74.7	75.4	75.3
Time-limited, major (3.4)	13.1	10.7	7.7	9.7.
Allergies (5)	4.2	6.7	7.9	7.4
Asthma (6)	4.8	6.6	7.2	6.9
Likely to recur (7,8,9)	50.1	59.1	55.0	57.9
Chronic medical, stable (10)	7.7	6.3 .	7.5	7.6
Chronic medical, unstable (11)	3.8	2.3	2.0	I.8
Chronic specialty, stable (12,13,14)	2.5	3.2	3.7	3.2
Chronic specialty, unstable (16,17,18)	0.7	0.9	0.7	0.8
Dermatologic (20)	3.2	4.4	4.6	4.6
Injuries/adverse effects, minor (21)	9.8	15.6	17.6	16.6
Injuries/adverse effects, major (22)	7.8	10.3	II.3	10.4
Psychosocial, acute, minor (23)	1.4	1.9	1.8	2.1
Psychosocial, recurrent or persistent, stable (24)	4.1	4.7	5.3	5.7
Psychosocial, recurrent or persistent, unstable (25)	0.6	0.3	0.5	0.7
Malignancy (32)	0.2	0.2	0.3	0.2
Pregnancy (33)	1.1	0.9	0.9	1.1

AFDC Adults	Nonparticipant	Delayed Participation	Full Participation	Discharged
Time-limited, minor (1,2)	36.5	51.3	56.8	54.8
Time-limited, major (3,4)	12.9	18.3	15.8	17.1
Allergies (5)	3.3	7.5	8.2	8.1
Asthma (6)	2.0	4.1	3.8	4.2
Likely to recur (7,8,9)	32.9	50.1	52.8	53.9
Chronic medical, stable (10)	15.4	22.3	25.8	23.4
Chronic medical, unstable (11)	5.8	7.3	8.8	7.8
Chronic specialty, stable (12,13,14)	2.7	5.7	5.5	5.0
Chronic specialty, unstable (16,17,18)	1.1	1.6	1.6	1.9
Dermatologic (20)	4.0	6.1	6.1	5.8
Injuries/adverse effects, minor (21)	11.6	18.7	21.2	21.0
Injuries/adverse effects, major (22)	8.5	12.7	12.7	14.9
Psychosocial, acute, minor (23)	2.7	3.2	3.5	4.0
Psychosocial, recurrent or persistent, stable (24)	8.4	11.3	13.2	13.8
Psychosocial, recurrent or persistent, unstable (25)	2.8	3.2	3.2	3.8
Malignancy (32)	0.8	0.8	1.0	0.6
Pregnancy (33)				

	Nonparticipant	Delayed Participation	Full Participation	Disenrolled
SSI Adults				
Time-limited, minor (1,2)	9.1	53.6	59.7	54.9
Time-limited, major (3,4)	5.3	22.3	22.3	21.0
Allergies (5)	0.5	8.2	8.2	6.4
Asthma (6)	0.8	6.9	6.6	5.2
Likely to recur (7,8,9)	9.5	51.3	55.1	50.8
Chronic medical, stable (10)	12.1	56.7	54.7	52.1
Chronic medical, unstable (11)	7.9	32.0	33.5	31.0
Chronic specialty, stable (12,13,14)	2.6	12.5	10.4	11.9
Chronic specialty. unstable (16,17,18)	0.4	3.4	3.5	2.8
Dermvologic (20)	2.4	7.3	9.2	6.4
Injuries/adverse effects, minor (21)	2.7	24.9	23.9	18.7
Injuries/adverse effects, major (22)	3.7	17.0	18.4	15.9
Psychosocial, acute, minor (23)	1.1	5.8	6.8	8.3
Psychosocial, recurrent or persistent, stable (24)	5.0	20.4	24.2	21.3
Psychosocial, recurrent or persistent, unstable (25)	7.6	18.5	19.6	17.4
Malignancy (32)	1.5	4.3	3.7	2.9
Pregnancy (33)	0.2	1.6	i.7	1.4

2.3.2 illness Burden Among PCN Participants and Eligible Nonparticipants

To determine whether participants of the PCN program differed in their health care needs from eligible nonparticipants, we computed the percentages of Medicaid beneficiaries in PCN . counties with **selected ADGs** broken out by their level of PCN participation in 1993, as shown in Table **5-5.** For children who had participated in the program during 1993, the percentages of children with the different ADG clusters was quite similar regardless of whether they enrolled late, were continuously enrolled, or disenrolled during the year. On the other hand, nonparticipants were somewhat less likely to have had care for most of the ADG clusters. Notable exceptions were major time-limited conditions and stable and unstable chronic conditions requiring only medical management.

The percentages of adult PCN participants who had care in 1993 for the various ADG clusters were also very similar regardless of whether they enrolled late, were continuously enrolled, or disenrolled during the year. Furthermore, like the children, AFDC and other non-SSI adults who did not participate in the PCN program had a lower prevalence of ADG clusters than participants in 1993. For SSI adults, the difference in the prevalence of the ADG clusters was dramatically different; much lower percentages of nonparticipants had any of the ADG clusters compared to participants. For example, more than **half** of all participants had care for minor time-limited conditions, but fewer than 10 percent of nonparticipants did. Similarly, more than half of the SSI adult participants had care for a stable, medically managed chronic condition, but only 12 percent of nonparticipants did.

Comparing the percentages of SSI adult beneficiaries in control counties with the selected **ADGs** from Table 5-3 with those in Table 5-5, we find that the prevalence of disease among SSI beneficiaries in control counties is between the prevalence rates for program participants and eligible nonparticipants in PCN counties in 1993. Thus, at least among the adult SSI population, we have found a significant selection bias. However, instead of the managed care program covering the healthier patients as in the competitive private health insurance market, the PCCM program in New Mexico covered those SSI Medicaid beneficiaries with the greatest illness burden as reflected in diagnoses from claims data.

2.3.3 Determinants of PCN Enrollment and Disenrollment

Given the variations in the characteristics and illness burden of PCN participants and nonparticipants, we decided to investigate the phenomena further by running multivariate **probit** models of the decisions to participate and to terminate participation in PCN. Separate **probits** were run for children, AFDC and other non-SSI adults, and SSI adults. Besides the demographic and Medicaid enrollment characteristics, we included various county-level supply and demand variables: the number of primary care physicians per 1000 population, the percentage of primary care physicians participating as PCN gatekeepers, the number of emergency rooms per square mile, an urban/rural indicator, and per capita income. The estimated, normalized **probit** coefficients for these equations are shown in Appendix Table F- 1.

The multivariate **probit** models generally confirm the bivariate results. Infants were less likely (37 percentage points) to enroll in the program compared to other children. However, once

enrolled, they were less likely to disenroll (20.9 percentage points). The elderly were also less likely to enroll in the program (32.5 percentage points) but were more likely to disenroll(28.3 percentage points) once they had enrolled compared to other SSI-related (blind and disabled) beneficiaries.

Minority populations were equally or more likely than whites to participate in the PCN program. Hispanic children, Native American adults in SSI-related eligibility groups, and **AFDC** and other non-SSI children and adults beneficiaries who were of other race/ethnicities were all slightly more likely to participate compared to whites. Native Americans and other race/ethnic groups were also more likely to disenroll from the PCN program compared to whites.

Eligible beneficiaries in rural counties were less likely to become PCN participants and more likely to have disenrolled from the program. Furthermore, the greater the ratio of PCN participating physicians to primary care physicians the more likely non-SSI Medicaid beneficiaries were to participate in PCN. Finally, the longer Medicaid beneficiaries were eligible to receive benefits in 1993, the more likely they were to have participated in PCN. However, beneficiaries were also more likely to terminate their participation in PCN the longer they were enrolled in Medicaid.

We reran the disenrollment model adding in dichotomous variables for the ADG clusters. Based on the estimated coefficients for these variables, illness burden had very little impact on participants' decisions to disenroll from the PCN program. Very few coefficients were even marginally significant and the significant coefficients showed no evidence that they resulted from anything except random noise.

3. Research Questions and Hypotheses

We investigated New Mexico's success in achieving four goals of PCCM programs: (1) to improve access to primary health care; (2) to promote the use of preventive care services; (3) to change patterns of service utilization; and (4) to control health care expenditures. In addition, we investigated whether the New Mexico PCN program had a differential impact on Hispanics, Native Americans, and whites. Our approach and the specific measures we used to assess the program's success along each of these dimensions is described below and summarized in Table 5-6.

3.1 Improve Access to Primary Health Care

Access is difficult to measure with claims data. Claims data provide measures of service use, which reflect not only the availability and accessibility of services but also the aggressiveness of outreach and education efforts, and are confounded by levels of medical need and other unobserved factors. Therefore, results from the claims data analysis can only provide evidence supporting or refuting improved access to care, but cannot be used to definitively prove the success of the program in meeting this goal.

Table 5-6. Measures Used to Analyze the Success of PCN in Achieving Specific Goals

	Access	Preventive Care	Use Patterns	Cost Control	Minority Impact
Any ambulatory days of care	✗		✗		✗
Number of ambulatory days of care	✗		✗		✗
Any ER visits	✗		✗		
Number of days of care with ER visits	✗		✗		
Any outpatients laboratory or radiology			✗		
Number of days with lab or xray services			✗		
Compliance with well-child schedule	✗	✗			
Compliance with immunization schedule	✗	✗			
Compliance with annual pap smears	✗	✗			
Referrals during EPSDT visits	✗				
Any medications			✗		✗
Number of medications			✗		✗
Any non-delivery hospital stays			✗		✗
Number of nondelivery hospital days			✗		✗
Number of delivery days			✗		
Any hospitalizations for ACS conditions	✗				
Any Medicaid payments				✗	✗
Total Medicaid payments				✗	✗

We were able to construct several measures from the New Mexico claims data files that were indicative of access to care. First, we hypothesized that beneficiaries with compromised access to care would forgo routine primary care. Therefore, an increased number of ambulatory days of care would alone not necessarily be representative of improved access, but in combination with other measures, would indicate at least that access had not deteriorated under the program.

Second, we hypothesized that beneficiaries with compromised access to routine care would be more likely to enter the health care system through emergency rooms (ERs) and would be more likely to be hospitalized for preventable, ambulatory care sensitive conditions (ACSCs). We constructed measures for whether beneficiaries had any ER visits, the number of ambulatory days of care with ER visits, and whether the beneficiary had any hospitalizations for ACSCs. A list of ACSCs relevant to a Medicaid population was developed specifically for this project by our physician consultant. These conditions and the diagnosis'codes and other restrictions used to compute them are shown in Appendix A.

Finally, the New Mexico claims data contain records with state-specific codes for EPSDT screening visits. In particular, these codes indicate whether the EPSDT provider referred the child for further diagnosis and treatment. Although EPSDT screening and enhanced services are exempt from the PCCM, the requirement for other referrals to be made through the PCP can nevertheless affect the frequency at which children are referred for further diagnosis and treatment of problems discovered during EPSDT screening visits. Equivalent or increased referrals among program participants compared to nonparticipants, holding constant health status, would show that access to necessary follow-up care is at least not being restricted by EPSDT providers.

3.2   Promote Preventive Care

The success of the PCN program in promoting preventive care is much easier to measure with claims data because of the age-specific guidelines for receipt of such care. Thus, we can measure the success of the PCN program relative to the regular Medicaid FFS program, as well as against accepted national standards. In particular, we investigated the extent to which preschool-aged children had well-child care visits and received immunizations for childhood diseases. In addition, we investigated whether the PCN program had any effect on whether women in child-bearing ages (19 to 39 years) received annual pap smears. We hypothesized that primary care case management under PCN improved compliance with national guidelines for the receipt of these preventive care services.

As mentioned above, the New Mexico claims file contains state-specific codes for EPSDT screening visits. EPSDT screening visits are comprehensive well-child visits. States must have a recommended periodicity schedule for EPSDT screening visits. In many states, including New Mexico, this schedule is identical to the American Academy of Pediatrics (AAP) schedule for health supervision visits (Orloff et al., 1992). The AAP schedule recommends six visits in the child's first year of life, three visits in the child's second year, an annual visit from ages three to six years, and a visit every other year from ages seven to 20 years. We computed

the percentage of children with EPSDT visits.' In addition, we computed an index for preschool-aged children that measures compliance with the AAP-recommended schedule of health supervision visits adjusting for the child's age at the end of the year and the number of months the child was enrolled in Medicaid during the year.

The AAP also recommends that certain childhood immunizations be administered to children at specific intervals that coincide with the health supervision visits. These immunizations are often billed separately and, therefore, have their own claims records. With these records, then, we investigated compliance with the AAP periodicity schedules for three common childhood immunizations among children aged two to 30 months: (1) the diphtheria-tetanus-pertussis (DTP) series recommended at 2, 4, 6, and 18 months of age; (2) the oral polio vaccine (OPV) series recommended at 2, 4, and 18 months of age; and (3) the measles, mumps, and rubella (MMR) vaccine recommended at 15 months of age.

Compliance indexes similar to the EPSDT visit index described above were computed for these immunizations and for the three vaccines combined. Details of how we computed the indexes and a list of the procedure codes used to identify EPSDT visits, the immunizations, and pap smears are provided in Appendix B.

3.3   Change Patterns of Service Use

A fundamental tenet of all PCCM programs is that improved primary and preventive care will reduce the need for more costly and inappropriate and duplicate diagnostic and treatment services. Thus, a successful program might be reflected in a reduction in the use of laboratory and radiology examinations, medications, and the number of hospital stays and inpatient days of care.

However, among a population with a significant amount of unmet health care needs, increased access to routine primary care can initially result in increased use of these services. Because we do not know the level of unmet need among the New Mexico Medicaid population and because our analysis is not designed to track individuals' health service use over time, we made no predictions of the impact of the PCN program on these measures. If there are unmet needs and these needs differ systematically between PCN and control counties, then the estimated effect of the program will reflect a combination of the effect of PCCM and the differences in the distribution of these unmet needs. Our approach for controlling for unmet need is described below.

In addition to the measures described above in section 3.2 and 3.3, we investigated differences in the use of laboratory and radiology examinations, medications, and inpatient hospital care among program participants and ineligible and nonparticipating Medicaid beneficiaries. In particular, we investigated the likelihood of any use and the level of use among

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[7] During our site visit to New Mexico, State workers suggested that EPSDT screening visits were underreported because providers do not want to deal with the forms and therefore bill for a well-child visit instead (RTI, 1997). However, we searched the claims data for a series of preventive care procedure and diagnosis codes (listed in Appendix C) to find and count these visits. We found only a handful of non-EPSDT well-child visits.

users of outpatient laboratory and radiology services, outpatient medications, and both *delivery-related* and non-delivery-related hospitalizations.

3.4 Control Health Care Expenditures

Besides improved health outcomes, a desired outcome of all managed care programs is reduced total health care costs. It is hoped that the increased expenditures for primary and preventive care services and the added case management fees will be more than offset by reduced expenditures from less expensive treatment and fewer hospitalizations and emergency services.

However, because data for the analysis are collected during early years of PCN enrollment, we expect to see little, if any, reduction in overall costs per beneficiary. We investigated health care service use and expenditures in an early implementation year among a population that may have been poorly covered by health insurance and/or poorly served by primary care providers prior to enrollment in the PCN program. Many of these people may have a backlog of health care needs which will serve to temporarily increase diagnostic and treatment services once they have gained improved access to primary care under the program. Again, because of these concerns we will control for differences in the distribution of illness between PCN and control counties.

3.5 Impact on Minorities

Approximately one half of all New Mexico Medicaid beneficiaries eligible for the PCN program in 1993 were Hispanic and another 1 I percent were Native American. Recent findings from the 1996 Medical Expenditures Survey (MEPS) show that Hispanic Americans are substantially more likely than other Americans to lack a usual source of health care and to use hospital-based sources when they did have a usual source of care (Weinick, et al., 1997). In addition, families with a Hispanic head of family were more likely than others to experience obstacles to receiving care, particularly the inability to afford care. Another recent MEPS study found Hispanic children more likely to be in fair or poor health (Weigers et al., 1998).

On the other hand, the 1987 National Medical Expenditure Survey found Native Americans living on or near reservations and eligible for health care from the IHS to be more likely to have a usual source of care than the general U.S. population and to be at least as likely to receive care for selected acute conditions (Beauregard et al., 199 1). Nevertheless, Native Americans faced larger waits and spent more time traveling to obtain care and their choice of providers and services was limited to the IHS.

Because of the differences noted above in access to care for Hispanic and Native American populations generally in the U.S., it is important to determine, first, whether these differences existed among New Mexico's Hispanic and Native American populations covered by Medicaid and, second, whether the PCN program had a differential impact on either group.

4. Methodology

The use of health care services varies dramatically by Medicaid eligibility category. Beneficiaries enrolled in Medicaid under non-cash-assistance eligibility categories often enroll only when they need health care services. Hence, they typically have higher levels of service use than AFDC cash assistance recipients. In particular, pregnancy qualifies women for eligibility under poverty-related expansion categories. Furthermore, SSI cash assistance recipients typically have higher levels of service use than AFDC and other program eligibles; many qualify for SSI payments because of chronic disabling medical conditions which require continuing medical care. Children also have different service use patterns than adults; they receive more preventive care and care for time-limited (acute) conditions compared to adults. Therefore, we analyzed the patterns of service use and expenditures by eligibility status and age group. We performed both tabular and multivariate analyses.

4.1 Descriptive Analysis

For the descriptive analysis, we broke the study population out into six groups: (1) children enrolled under AFDC-related eligibility categories, (2) children enrolled under SSI-related eligibility categories, (3) children enrolled under other eligibility categories (primarily Ribicoff and poverty-related expansion categories), (4) adults enrolled under AFDC-related eligibility categories, (5) adults enrolled under SSI- related eligibility categories, and (6) adults enrolled under other eligibility categories (primarily poverty-related expansion categories for pregnant women). We first compared the probability and levels of use among beneficiaries in the different county groups and within county group over time. Then, we compared the changes over time across the county groups (i.e., the difference in differences). Only by this last comparison can we tell whether the PCN program had a meaningful impact on health service use. We also investigated the difference in differences in the various service use and expenditure measures using multivariate techniques.

The difference in differences (DD) is measured by subtracting the change in the measure of interest from the pre- to the post-period in PCN counties from the change in the measure from the pre- to the post-period in control counties:

$$DD = (Y_{post \cdot PCN} - Y_{pre \cdot PCN}) - (Y_{post \cdot Control} - Y_{pre \cdot Control})$$

A positive sign indicates that the measure increased more (or decreased less) in PCN counties than in the control counties, and a negative sign indicates that it decreased more (or increased less) in the PCN counties compared to the control counties. Essentially, if an increase in the measure is considered a desirable program effect, as in the case of preventive care use, then we are looking for a positive sign on the DD. Alternatively, if a decrease in the measure is considered a desirable program effect, as in the case of ER visits, then we are looking for a negative sign on the DD.

4.2 Multivariate Analyses

For the multivariate analyses, we reduced the number of population groups to three: (1) children, (2) adults enrolled under AFDC-related and other non-SSI eligibility categories, and (3) adults enrolled under SSI-related eligibility categories. This break out reduced the number of regressions we had to estimate and display and, at the same time, allowed separate behavioral estimates for the groups most frequently targeted by different legislative initiatives.'

A limitation of the tabular analyses is that they fail to control for other factors that may influence service use and costs (e.g., age, race, gender, illness burden). Therefore, we extended our bivariate analysis to multivariate regression and probit analyses in which we estimated first the impact of the PCN program on the county as a whole, then on the PCN participants by their level of involvement in the program, and finally on the different minority populations in New Mexico.

The basic analytic model is a pre/post, comparison group design:

$$Y_{it} = f(\alpha + \gamma_T T_t + \gamma_E E_{it} + \gamma_{TE} TE_{it} + \beta X_{it} + u_{it})$$

where
- Y is the dependent variable;
- i indexes the individual;
- t indexes the year;
- X is a vector of regressors that vary over time and across people;
- E indicates if the person lived in a PCN county ($E=1$) or a control county ($E=0$); and
- T indicates if the observation is for 1993 (T=l) or 1990 (T=O).

The program effect is estimated by the coefficient of the indicator variable TE that represents the interaction of the pre/post indicator T and the experimental/comparison group indicator E. This coefficient measures the difference between the experimental and comparison groups in the change in the outcome measure over time, i.e., $\gamma_{TE} = [(Y_{T=1,E=1} - Y_{T=0,E=1}) - (Y_{T=1,E=0} - Y_{T=0,E=0})]$] x or the difference in differences. Entered as such it measures the net overall impact of the PCN program on the population included in the regression. For the probability of any service use, we used a'probit model and present normalized probit estimates of the coefficients.'

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[8] To control for non-AFDC-related eligibility categories, a dichotomous variable for SSI-related enrollment was included in the equations for children, and dichotomous variables for enrollment in other than SSI-related and AFDC-related categories in 1990 and 1993, respectively, were included in the equations for children and non-SSI adults. Separate variables were included for 1990 and 1993 because the composition of this group changed significantly with the introduction of poverty-related expansion eligibility.

[9] Normalized probit estimates are calculated for the j'th variable as $\beta_j \phi(z)$, where $z=\Phi^{-1}(p)$, p is the sample mean of the response variable, Φ^{-1} is the inverse of the standard normal cumulative density function, and β_j is the probit coefficient for the variable. The change in probability for changes in dichotomous variables is calculated for a discrete change of the dichotomous variable from 0 to 1. The normalized coefficients for continuous variables correspond to the incremental change in the probability of enrolling in PCN for an infinitesimal change in the independent variable.

For the level of use among users of services, we ran ordinary least squares (OLS) regressions on log transformed dependent variables.

To determine the differential impact on beneficiaries in PCN counties by their level of participation, we reran each equation replacing the TE variable with indicator (dichotomous) variables for four mutually exclusive categories of PCN participation-late beneficiaries, full-period beneficiaries, disenrollees, and nonparticipants." Similarly, to determine whether minority populations were differentially affected by the program, we reran a subset of the equations replacing the TE variable with four variables representing the interaction of residing in the PCN counties in 1993 and being in one of the four race/ethnic@ categories-white, Hispanic, Native American, and other.

4.3 Selection Bias

The estimated coefficients for the four PCN participation indicators provided evidence of a systematic difference in the patterns of service use and expenditures between Medicaid beneficiaries who participated in PCN and those who did not-nonparticipants were less likely to use services and used significantly fewer services. If nonparticipants were not being enrolled because of some random process related to the administrative problems noted above (e.g., staffing limitations), then we should not see any systematic differences in service use and expenditures between control county recipients and PCN county recipients who were not enrolled in PCN (controlling for county, year, and demographic factors). However, the differences found between nonparticipants in PCN counties and control county beneficiaries suggest that there was an underlying process influencing the decision to enroll that may influence the estimated effect of the program. In particular, if nonparticipants with fewer needs systematically opted out of PCN, then they would appear to have had lower service use than control county beneficiaries and beneficiaries in the PCN program.

To address these concerns, we attempted to understand and control for the underlying process determining PCN enrollment. We tried two estimation techniques: (1) a **Heckman-Lee** sample selection model, and (2) the addition of case-mix adjustors as explanatory variables in the service use equations. Ideally we would estimate a He&man-Lee model to control for the process of sample selection. However, to properly identify such a model requires instrumental variables that are correlated with the decision to enroll and but are uncorrelated with the probability and level of service use. The variables available for our analyses were limited to claims-based data and county-level variables available from the Area Resource File. All of the variables that were significant in the first stage were also significant in the second stage. Given this limitation, He&man-Lee models of sample selection serve only as a very specific specification test; in these cases, the sample selection term" is a non-linear function of all of the

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[10] Beneficiaries who enrolled in the PCN program in 1993 after their first month of Medicaid enrollment that year (i.e., late beneficiaries) and who subsequently disetuolled before the end of their 1993 Medicaid enrollment period are classified as disenrollees.

[11] The inverse Mills ratio of the normal probability density function divided by the normal cumulative density function.

regressors in the model. Many economists feel this is an insufficient correction for sample selection. In tests of this model on the probability and level of Medicaid payments, we also felt that the correction was insufficient and therefore did not further consider this type of adjustment.

If the process that is driving the differences in service use and expenditures between PCN participants and nonparticipants is health status, then the addition of case-mix adjustors to the equations may control for the influence of 'the differences on the program impact variables. Because we found significant differences between SSI-related beneficiaries who participated in PCN and those who did not participate, we added dichotomous variables for the 32 ADG clusters to the service use and payments equations.[12] However, for equations that were run on the full study population—the probabilities, respectively, of any ambulatory care, any outpatient medications, any inpatient care, any ACSC hospitalizations, and any Medicaid payments-we could not add the ADG variables because we had no information on the health status of persons with no contacts with health providers during the year—i.e., there would be no variation in the ADG variables among beneficiaries with no medical care.

Besides the ADG variables and county and year indicators, other control variables used in the multivariate equations fall into three categories: demographic, Medicaid enrollment, and county-level supply and demand. These variables are listed in Table 5-7. For services with relatively rare occurrences, such as ACSC hospitalizations, some small counties ended up with no beneficiaries with services-i.e., the county variable would perfectly predict the outcome. To avoid the program from dropping these observations, we replaced the fixed county effects with the county-level supply and demand factors.

4.4 **Counterfactual Simulations of Medicaid Expenditures under FFS**

To estimate what Medicaid expenditures would have been in the control counties in the absence of the PCN program, we used a two-part model (Duan et al., 1983). In the first stage, we estimated a probit equation to model the probability of having positive expenditures:

$$P_{it} = Pr(Expenditures_{it} > 0) = f(X_{it}\beta_1 + \epsilon_{1it})$$

In the second stage, we estimated a log-linear model to explain the variation in expenditures conditional on having non-zero expenditures:

$$\log(Expenditures_{it} \mid Expenditures_{it} > 0) = X_{it}\beta_2 + \epsilon_{2it}$$

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[12] If health status measured in this way is a function of the PCN program, then the ADGs may be endogenous and would confound the relationship between outcomes and the PCN program. To avoid this potential limitation, we would have liked to have measured health status as a function of the ADGs in the periods prior to our analysis (i.e., 1989 for 1990 claims and 1992 for 1993 claim). Unfortunately, we did not have these data.

Table 5-7. Independent Variables for the Regression Analyses

Demographic variables:
- age,
- gender, and
- race/ethnicity (white, Hispanic, Native American, and other).

Medicaid eligibility and enrollment variables:
- number of months enrolled during the year; and
- eligibility category (AFDC and related categories; SSI and related categories; and other women and children, including Ribicoff children and poverty-related expansion categories).

County-level *supply and demand variables:*
- the number of primary care physicians per 1000 population; or
- the number of children per child health provider (EPSDT and immunization equations only); and
- county fixed effects.

The following variables were used where the number of observations was inadequate to support county fixed effects:
- the percentage of primary care physicians participating as PCN gatekeepers;
- the number of emergency rooms per square mile;
- per capita income; and
- urban/rural designation.

Illness Burden:
- ambulatory diagnostic groups clusters

Program variables:
- interaction between the 1993 year indicator and the indicator for residence in a PCN county; and
- PCN participation (full, delayed, disenrolled, and not participating).

Because we used a log-linear model, we had to retransform log expenditures using a smearing factor as described by Duan et al (1983) before simulating the counterfactual expenditures. Therefore, expected Medicaid expenditures from the two-part model are:

$$E(Expenditures_{it}|X_{it}) = P_{it}\,\phi\,\exp(X_{it}\,\beta_{2it})$$

where the retransformation factor, ϕ, is equal to:

$$Exp(\sigma^2_{\epsilon_2}/2)$$

and σ^2 is the variance of the error term from the second stage.

To perform this simulation we estimated the equations above using data from the comparison counties for 1990 and 1993. The regressors in both models were identical, except for the addition of indicators for the 32 ADGs which were added to the second stage equation. To limit the influence of outliers on the results of the second stage, we restricted this regression to observations with expenditures no greater than three standard deviations of the mean value of expenditures. We then applied the estimated coefficients to data from 1993 PCN counties to simulate what average expenditures in 1993 would have been if beneficiaries in the PCN counties were under a FFS system.[13]

5. Results

5.1 Access to Care

As described above, we investigated different service use measures to determine the programs's impact on access to care. These include ambulatory days of care, with a focus on the setting of care in general and ER visits in particular; ACSC hospitalizations; and the frequency with which children with EPSDT visits are referred for further diagnosis and treatment.

51.1 Total Ambulatory Care Days

The percentage of beneficiaries with any ambulatory days of care and the number of ambulatory care days per beneficiary with at least one day are shown in Table 5-8 by eligibility category, county group, and year. In both 1990 and 1993, except for adult beneficiaries eligible under the poverty-related expansions, a higher percentage of beneficiaries in PCN counties had at least one day during which they had ambulatory care compared to beneficiaries in control counties. In addition, beneficiaries in all eligibility groups in PCN counties had a greater number of days with ambulatory care compared to beneficiaries in control counties.

Except for adult beneficiaries under the expansion eligibility category, the percentage of beneficiaries with ambulatory care days increased from 1990 to 1993 in both PCN and control counties. The number of days with ambulatory care also increased for all eligibility groups in both counties during this time. The difference between PCN and control counties in the percentage of beneficiaries with ambulatory care days narrowed slightly from 1990 to 1993 for AFDC- and SSI-related eligibility groups but increased for other eligibility groups. Among beneficiaries with ambulatory care, the difference between the county groups in the number of days with ambulatory care increased or remained constant in all eligibility groups.

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[13] We also applied the coefficients to the data from the control counties in 1993 and compared the resulting predicted FFS expenditures to the actual FFS expenditures in these counties in 1993. This comparison shows how accurately the model predicts expenditures and how wide a difference in PCN and FFS expenditures is needed to confidently identify a program effect.

Table 5-8. Percentage of Beneficiaries with at Least One Ambulatory Day of Care and the Number of Ambulatory Care Days per Beneficiary with Ambulatory Care by Eligibility Group in PCN and Control Counties, 1990 and 1993

	PCN Counties		Control Counties		Difference in Differences
	1990	1993	1990	1993	
Percentage of Beneficiaries with Ambulatory Care Days					
AFDC Children	66.0	**75.6**	**57.9**	69.1	-1.6
SSI Children	80.2	**83.2**	77.6	82.1	-1.5
Other Children	72.5	**77.7**	64.5	68.5	1.2
AFDC Adults	69.4	**74.2**	61.1	68.7	-2.8
SSI Adults	44.2	**54.6**	37.7	49.0	-0.9
Other Adults	92.0	**94.7**	92.0	91.8	2.9
Number of Ambulatory Care Days Per Beneficiary with Events					
AFDC Children	**3.9**	5.3	3.5	4.6	0.3
SSI Children	**9.3**	13.1	7.7	10.3	1.2
Other Children	4.6	6 . 1	4.1	5.0	0.6
AFDC Adults	5.7	6.9	4.9	5.7	0.4
SSI Adults	8.3	12.4	7.9	12.0	0.0
Other Adults	5.7	8.8	5.7	8.0	0.8

The results of the multivariate analysis are shown in Table 5-9 separately for children, AFDC and other non-SSI adults, and SSI adults. For the probability of any ambulatory care days during the year, we show the normalized probit coefficients of the interaction term for residence in a PCN county and the 1993 data year and coefficients for this term broken out by PCN participation status. These coefficients all represent the difference in the differences between county groups over time. We show similar OLS regression coefficients for the impact on the number of ambulatory days of care among users.[14]

The multivariate results show a small, significant, negative impact of the PCN program on the likelihood of any ambulatory days of care among Medicaid children and non-SSI Medicaid adults in 1993. However, the negative impact of the program was greatest among beneficiaries who had not participated in the program. We also found a negative, although insignificant, coefficient for the program impact variable among SSI adults in the probit equation

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[14] A fuller set of estimated coefficients are presented in **Appendix Tables F-2 and F-3.**

for the likelihood of any ambulatory care days. However, we found that SSI adults who had participated in the PCN program were significantly more likely to have had ambulatory care days and SSI adults who had not participated were significantly less likely to have had any ambulatory care days in 1993.

Adjusting for the distribution of ADGs in the OLS regression for the number of ambulatory care days among beneficiaries with at least one day of care, we found the PCN program effect to be consistently significant and positive among children and AFDC and other non-SSI adults, regardless of the extent of program participation and even among nonparticipants. For SSI beneficiaries, the program's impact on the number of days of care among users in the county overall was significant, but was concentrated among nonparticipants.

Thus, at the county-level, the program's effect on the incidence of ambulatory care days is mixed-decreasing the likelihood of any ambulatory care and increasing the number of days of care among individuals with some care. The program effect for individuals in different PCN participation categories was similar, except for SSI-related beneficiaries. Elderly and disabled beneficiaries who participated in PCN were more likely to have any care and to have more days of care compared to nonparticipants.

Table 5-9. Estimated Coefficients for the Differences in the Probability and Number of Ambulatory Care Days in PCN and Control Counties from 1990 to 1993

	Probability of Any Ambulatory Care[1]			Number of Ambulatory Care Days/User[2]		
	Children	AFDC & Other Non-SSI Adults	SSI Adults	Children	AFDC & Other Non-SSI Adults	SSI Adults
All beneficiaries in PCN counties	-.029** (-4.51)	-.052** (-4.53)	-.032 (-2.41)	.107** (12.09)	.111** (6.72)	.095* (2.88)
Delayed participation	-.007 (-0.90)	-.010 (-0.67)	.207** (7.78)	.100** (9.70)	.126** (6.36)	.042 (.089)
Full participation	-.007 (-1.00)	-.034 (-2.48)	.195** (10.96)	.108** (10.79)	.121** (6.60)	.078 (2.11)
Disenrolled during year	-.011 (-1.32)	-.024 (-1.53)	.242** (9.29)	.090** (8.31)	.104** (5.15)	-.014 (-0.29)
Nonparticipant	-.081** (-10.12)	-.119** (-8.30)	-.134** (-9.77)	.138** (12.50)	.080** (3.71)	.156** (4.31)

[1] Not adjusted for Ambulatory Diagnostic Groups.
[2] Adjusted for Ambulatory Diagnostic Groups.
** $p \leq .001$
* $p \leq .01$

**Table S-10. Percent Distribution of Ambulatory Care Days by Setting of Care
in PCN and Control Counties, 1990 and 1993**

	PCN Counties		Control Counties		Difference in Differences
	1990	1993	1990	1993	
Office	61.9	55.0	49.1	44.9	-2.7
Outpatient dept.	13.4	14.2	10.0	9.3	1.5
Emergency room	6.7	6.1	6.8	7.5	-1.3
Other setting	13.3	17.5	28.8	29.8	3.2
Unknown setting	4.6	7.2	5.4	8.4	-0.4

5.1.2 The Setting of Care

The percentage distribution of ambulatory care days by setting of care in the PCN and control counties is shown in Table 5-10. In both county groups, the most frequently used setting of care was physicians' offices. Ambulatory care was received in physicians' offices more often in PCN counties than in control counties. In contrast, beneficiaries in control counties were more likely to receive their care in other settings, such as community health centers, than were beneficiaries in PCN counties. The percentage of days of ambulatory care received at physicians' offices declined and the percentage of care received at other settings increased from 1990 to 1993 in both county groups with the largest changes seen in PCN counties. Nevertheless, office care remained relatively more frequent and care in other settings relatively less frequent in PCN counties than in control counties in 1993.

In 1990, an equal percentage of ambulatory care days in PCN and control counties was received at ERs, but by 1993, there was a lower percentage of ambulatory care days with ER visits in the PCN counties than in the control counties. The percentage of ambulatory care days at ERs declined from 6.7 percent in 1990 to 6.1 percent in 1993 in PCN counties but increased from 6.8 percent to 7.5 percent in control counties.

The percentage of beneficiaries with any ER visits and the number of ambulatory care days with ER visits per beneficiary with at least one ER visit are shown in Table 5-1 1. In both 1990 and 1993, except for adultsand children in non-AFDC- and non-SSI-related eligibility categories, a higher percentage of beneficiaries in PCN counties had at least one ER visit compared to beneficiaries in control counties. Among beneficiaries with ER visits, little difference existed between the county groups in the number of ER visits made.

The percentage of beneficiaries with ER visits and the number of ER visits per beneficiary with ER visits increased from 1990 to 1993 in all eligibility and county groups. However, the differences between the PCN and control counties in the percentage of beneficiaries with ER visits narrowed somewhat from 1990 to 1993 because the increase was smaller among beneficiaries in PCN counties.

The results of the multivariate analysis of the likelihood and number of ambulatory care days with ER visits are shown in Table 5-12 separately for children, AFDC and other non-SSI adults, and SSI adults." These data show that the PCN program had no impact on the use of ERs among adult beneficiaries at the county level. At the participant level, we found only two significant coefficients in the adult equations: adult SSI beneficiaries who had disenrolled from the PCN program in 1993 were more likely to have had ER visits and adult SSI beneficiaries who did not participate in the PCN program were less likely to have had ER visits during the year.

Table 5-11. Percentage of Beneficiaries with at Least One Emergency Room (ER) Visit and the Number of Ambulatory Care Days with ER Visits per Beneficiary with ER Visits by Eligibility Group in PCN and Control Counties, 1990 and 1993

	PCN Counties		Control Counties		Difference in Differences
	1990	1993	1990	1993	
Percentage of Beneficiaries with ER Visits					
AFDC Children	24.4	28.1	20.8	27.3	-2.8
SSI Children	22.9	27.8	15.8	24.7	-4.0
Other Children	24.4	26.2	26.2	29.8	-1.8
AFDC Adults	25.2	30.5	19.9	26.4	-1.2
SSI Adults	18.9	20.1	18.4	18.9	0.7
Other Adults	26.5	27.9	25.0	29.8	-3.4
Number of Ambulatory Care Days with ER Visits Per Beneficiary with ER Visits					
AFDC Children	1.4	1.5	1.4	1.6	-0.1
SSI Children	1.5	1.6	1.5	1.9	-0.3
Other Children	1.4	1.5	1.5	1.7	-0.1
AFDC Adults	1.5	1.6	1.5	1.7	-0.1
SSI Adults	1.9	2.2	1.7	2.0	0.0
Other Adults	1.5	1.6	1.5	1.6	0.0

The results of the multivariate analysis present a different story for children; the PCN program significantly reduced the likelihood that children would use ERs by 2.5 percentage points on average. In addition, children who participated in the PCN program for their full Medicaid enrollment period and used the ER during 1993 had 4 percent fewer visits than children not eligible for PCN coverage.

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[15] A fuller set of coefficients are shown in Appendix Tables F-4 and F-5.

Table 5-12. Estimated Coefficients for the Differences in the Probability and Number of ER Visits Among Beneficiaries with Ambulatory Care Days in PCN and Control Counties from 1990 to 1993

	Probability of Any ER Visits[1]			Number of ER Visits/User[1]		
	Children	AFDC & Other Non-SSI Adults	SSI Adults	Children	AFDC & Other Non-SSI Adults	SSI Adults
All beneficiaries in PCN counties	-.025** (-3.40)	-.012 (-0.89)	.008 (0.60)	-.036* (-2.58)	-.039 (-1.51)	.003 (0.08)
Delayed participation	-.028** (-3.44)	-.004 (-.024)	.037 (2.10)	-.030 (-1.88)	-.054 (-1.83)	.046 (0.80)
Full participation	-.024* (-2.94)	-.016 (-1.11)	.027 (1.97)	-.040* (-2.64)	-.052 (-1.86)	-.007 (-0.14)
Disenrolled during year	-.027** (-3.18)	-.003 (-0.21)	.054* (2.94)	-.036 (-2.19)	-.031 (- 1.02)	.034 (0.60)
Nonparticipant	-.017 (-1.89)	-.023 (-1.41)	-.063** (-4.87)	-0.34 (-2.00)	.009 (0.27)	-.056 (-0.90)

[1]Adjusted for Ambulatory Diagnostic Groups.
** $p \leq .001$
* $p \leq .01$

5.1.3 Hospital Stays for Ambulatory Care Sensitive Conditions

Ambulatory care sensitive conditions are given as either the primary or secondary diagnosis for a significant portion of non-delivery-related hospitalizations among Medicaid beneficiaries-as much as half of all hospitalizations among children, a third of all non-delivery hospitalizations among AFDC adults, and two-fifths of non-delivery hospitalizations among SSI adults (Table 5-13). The top four conditions accounting for two-thirds of ACSC hospitalizations among New Mexico Medicaid beneficiaries in 1990 and 1993 were bacterial pneumonia, dehydration secondary to another disease, asthma, and dehydration as a primary diagnosis (Table 5-14).

Except for SSI children, the percentage of beneficiaries with hospital stays for ACSCs in PCN counties was equal to or slightly higher than percentages in control counties in both 1990 and 1993 (Table 5-13). From 1990 to 1993, the percentage of beneficiaries with ACSC hospital stays increased or remained the same in all county and eligibility groups. The discrepancies in the rates of hospitalizations for ACSCs between PCN and control counties either declined or remained unchanged over the study period, except among other non-SSI adults for whom the discrepancy grew slightly.

Table 5-13. Percentage of Beneficiaries with at Least One ACSC Hospitalization and the Percentage of Non-Delivery-Related Hospitalizations for ACSCs by Eligibility Group in PCN and Control Counties, 1990 and 1993

	PCN Counties		Control Counties		Difference in Differences
	1990	1993	1990	1993	
Percentage of Beneficiaries with ACS Hospital Events					
AFDC Children	1.4	1.6	1.1	1.7	-0.4
SSI Children	4.7	5.8	5.8	6.9	0.0
Other Children	2.5	2.6	2.0	2.6	-0.5
AFDC Adult	1.8	1.7	1.0	1.3	-0.4
SSI Adult	3.5	4.4	3.4	4.2	0.1
Other Adult	2.9	4.2	0.9	1.6	0.6
Percentage of Non-Delivery Hospitalizations for ACS Conditions					
AFDC Children	48.2	55.5	43.0	50.8	-0.5
SSI Children	47.6	47.0	36.9	55.4	19.1
Other Children	59.8	81.5	42.3	51.0	13.0
AFDC Adult	28.7	33.7	19.1	29.1	-5.0
SSI Adult	43.6	45.1	37.2	43.8	-5.1
Other Adult	92.9	77.8	20.0	72.7	-67.8

Table S-14. Percentage of ACSC Hospitalizations (and Rank Order) of the Top Ten ACSCs Resulting in Hospital Events in 1993 by PCN and Control Counties, 1990 and 1993

	PCN Counties		Control Counties	
	1990	1993	1990	1993
Bacterial pneumonia	25.9 (1)	27.8 (1)	25.5 (I)	25.7 (1)
Dehydration, secondary diagnosis	23.1 (2)	23.8 (2)	21.4 (2)	24.6 (2)
Asthma	11.7 (3)	12.4 (3)	8.4 (3)	14.1 (3)
Dehydration, primary diagnosis	6.7 (4)	7.3 (4)	8.1 (4)	6.7 (4)
Cellulitis	4.2 (7)	3.9 (7)	5.4 (7)	5.5 (5)
Congestive heart disease	4.9 (5)	4.9 (5)	6.2 (6)	3.8 (7)
Kidney/urinary tract infection	4.9 (6)	4.3 (6)	6.6 (5)	4.9 (6)
Chronic obstructive pulmonary disease	3.4 (9)	3.5 (8)	1.9 (10)	2.2 (9)
Pelvic inflammatory disease	3.6 (8)	2.0 (10)	3.0 (8)	2.7 (8)
Jaundice	2.4 (10)	2.4 (9)	2.9 (9)	1.3 (10)

As shown in Table 5-15, the multivariate results show a small, significant, negative effect of the PCN program on the probability of hospitalizations for ACSCs among children.[16] The impact of the program was also negative for adults. However, in the equations with the program broken out by PCN participation, the negative program effect for adults was only significant for nonparticipants.

5.1.4 Referrals for Further Diagnosis and Treatment

Children are often referred for further diagnosis and treatment during EPSDT screening visits. In 1990, compared to control counties, the percentage of children under 18 years of age with EPSDT visits who were referred for further diagnosis and treatment in PCN counties was lower for those enrolled in AFDC-related eligibility groups, higher for those enrolled in SSI-related eligibility groups, and equivalent for those enrolled in other eligibility groups (Table 5-16).

This situation changed markedly from 1990 to 1993. Substantial increases in the percentage of children referred during EPSDT visits occurred in all eligibility and county groups during this period. However, whereas the increases were fairly uniform across eligibility categories in PCN counties (ranging from 9 to 11 percentage points), the percentage of SSI beneficiaries with referrals increased 2 1 percentage points and the percentages of AFDC and other beneficiaries increased only 5 percentage points in control counties. Compared to control counties, PCN counties had a higher rate of referral for Ribicoff and other non-SSI children and equivalent rates of referrals for AFDC- and SSI-related child beneficiaries by 1993.

The results of the multivariate analysis, shown in Table 5-17, suggests that the PCN program increased the likelihood of referrals among children in 1993." However, significant increases in the probability of referrals was experienced by both PCN participants and nonparticipants, suggesting that EPSDT providers in PCN counties had a single standard of care for children regardless of PCN participation. Nevertheless, the evidence shows that some program change-either the implementation of PCN or some other initiative-made EPSDT providers in PCN counties more likely to refer children for further diagnosis and treatment compared to EPSDT providers in control counties.

5.2 Preventive Care

Below we present the results of our investigation of three measures of compliance with national preventive care standards: (1) compliance with the EPSDT periodicity schedule among preschool-aged children; (2) compliance with childhood immunization schedules for children aged two to 30 months of age; and (3) compliance with annual pap smear recommendations for women in childbearing ages.

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[16] A fuller set of coefficients are shown in Appendix Table F-6.

[17] A fuller set of coefficients are provided in Appendix Table F-7.

**Table S-15. Estimated Coefficients for the Differences in the Probability of
ACSC Hospitalizations in PCN and Control Counties from 1990 to 1993**

	Probability of Any ACSC Hospital Stays		
	Children	AFDC & Other Non-SSI Adults	SSI Adults
All beneficiaries in PCN counties	-.003* (-2.73)	-.006* (-2.57)	-.001 (-0.14)
Delayed participation	-.004* (-2.77)	-.003 (-1.27)	.013 (1.61)
Full participation	-.004** (-3.33)	-.005 (-2.21)	.014 (2.45)
Disenrolled during year	-.002 (-1.44)	-.006 (-2.26)	.040** (4.47)
Nonparticipant	-.002 f-1.631	-.007* (-2.68)	-.014* (3.15)

[1] Not adjusted for Ambulatory Diagnostic Groups.
** p ≤ .001
* p ≤ .01

**Table 5-16. Percentage of Beneficiaries Aged O-20 Years with Referrals During EPSDT Visits
by Age and Eligibility Group in PCN and Control Counties, 1990 and 1993**

	PCN Counties		Control Counties		Difference in Differences
	1990	1993	1990	1993	
All children	10.7	20.7	12.6	18.8	3.8
AFDC	11.2	19.8	14.8	20.0	3.4
SSI	39.2	49.2	31.1	51.9	-10.9
Other	7.2	17.9	7.4	13.2	5.9

Table 5-17. Estimated Coefficients for the Differences in the Probability of an Referral for Further Diagnosis and Treatment Among Children Under 18 Years of Age with EPSDT Visits in PCN and Control Counties from 1990 to 1993

	Probability of a Referral for Further Diagnosis and Treatment
All beneficiaries in PCN counties	.066** **(6.39)**
Delayed participation	.057** (4.68)
Full participation	.075** (6.19)
Disenrolled during year	.053** (4.14)
Nonparticipant	.098** (7.32)

[1] Adjusted for Ambulatory Diagnostic Groups (except for the preventive group)..
** p ≤ .001
* p ≤ .01

5.2.1 EPSDT Visits

The percentages of all Medicaid children with any EPSDT visits by eligibility category and county group in 1990 and 1993 are shown in Table 5-18. A higher percentage of children in PCN counties (51 percent) had an EPSDT screening visit compared to children in control counties (36 percent). The overall percentage of children with these visits was virtually unchanged from 1990 to 1993; small increases in the percentage of children with EPSDT screening visits among AFDC- and SSI-related eligibility groups were countered by declines in the percentage of other child beneficiaries with EPSDT visits.

Table S-18. Percentage of Beneficiaries Aged O-20 Years with at Least One EPSDT Visit by Eligibility Group in PCN and Control Counties, 1990 and 1993

	PCN Counties		Control Counties		Difference in
	1990	1993	1990	1993	Differences
All children	51.2	51.3	35.9	35.6	0.4
AFDC	46.9	47.8	30.4	32.0	-0.7
SSI	46.7	53.3	34.3	36.8	4.1
Other	60.5	56.1	51.8	41.7	5.7

To measure compliance with the periodicity schedule, we computed an EPSDT visit completion rate for children under six years of age. The rate determines the percentage of completed visits among the visits children were expected to receive based on the AAP periodicity schedule, the child's age at the end of the year, and the number of months the child was enrolled in Medicaid during the year.[18] These rates are shown in Table 5-19 for all Medicaid children under six years of age and separately for children up to two years of age and children aged three to five years.

Table 5-19. Adjusted' EPSDT Visit Index for Beneficiaries Aged 2 to 60 Months by Age and Eligibility Group in PCN and Control Counties, 1990 and 1993

	PCN Counties		Control Counties		Difference in Differences
	1990	1993	1990	1993	
All aged 0-5 yrs	44.7	54.6	30.9	36.7	4.1
Age					
0-2 years	43.9	55.6	30.7	37.8	4.6
3-5 years	49.1	50.3	31.4	32.5	0.1
Eligibility					
AFDC	42.6	51.5	25.6	33.1	1.4
SSI	50.3	68.6	26.7	39.5	5.5
Other	46.3	56.7	37.1	40.0	7.5

[1]If the number of visits received by children exceeded their expected number of visits, the number of visits received, **used** in the numerator of the visit index, was truncated to equal the expected number of visits rounded up to the nearest integer.

In both analysis years, preschool-aged children in PCN counties had nigher EPSDT visit compliance rates than preschoolers in control counties. The percentage of recommended visits that were received by infants and toddlers (0-2 years) grew significantly in both county groups from 1990 to 1993 with the greatest increase in PCN counties. In 1993, Medicaid children under three years of age in PCN counties had 56 percent of recommended EPSDT visits whereas in control counties these children had 38 percent of recommended visits. A slightly smaller percentage of recommended visits were completed among Medicaid children aged three to five years in 1993 (50 percent in PCN counties and 33 percent in control counties); little growth in compliance rates occurred in this age group over the study period. Breaking out the completion rates by eligibility category, we find that the SSI and other non-AFDC eligibility categories had the greatest increase in EPSDT completion rates in the PCN counties relative to the control counties.

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[18] See Appendix B for a description of the computation of this compliance rate.

Normalized probit coefficients on the dichotomous variable for whether children had the number of EPSDT screening visits recommended by the AAP confirm these findings (Table 5-20).[19] These data show that participation in the PCN program increased the likelihood that children under three years of age were in compliance with the recommended schedule of visits but had no effect on children aged three to five years. The largest impact was found for full-period participants (an 11 percent increase) and the next largest for children who disenrolled during the year (a 6 percent increase). The difference in the differences in the rates for nonparticipants in PCN counties and control county beneficiaries were not significant. Thus, the increased compliance found among participants can be considered a true program effect.

Table 5-20. Estimated Coefficients for the Differences in the Probability of Compliance with the AAP Well-Child Visit Schedule Among Children Aged 2 to 60 Months in PCN and Control Counties from 1990 to 1993

	Probability of Compliance with the AAP Well-Child Visit Schedule[1]		
	2 Mos - 2 Yrs	3-5 Yrs	2 Mos - 5 Yrs
All beneficiaries in PCN counties	.019 (1.67)	-.001 (-0.09)	.015 (1.64)
Delayed participation	.027 (1.98)	.007 (0.43)	-.006 (-0.54)
Full participation	.114** (6.48)	.001 (0.09)	.054** (4.87)
Disenrolled during year	.061** (3.73)	.005 (0.32)	.036* (3.11)
Nonparticipant	-.022 (-1.81)	-.029 (-1.58)	-.012 (-1.13)

[1] Adjusted for Ambulatory Diagnostic Groups (except for the preventive care group).
** $p \leq .001$
* $p \leq .01$

5.2.2 Immunizations

Children typically receive common childhood immunizations during specific EPSDT screening visits. These immunizations can be separately billed through the Medicaid program. We computed immunization completion rates for DTP, OPV, and MMR immunizations individually and combined, adjusting for the AAP periodicity schedule, the child's age at the end of the analysis year, and the number of months the child was enrolled in Medicaid during the year.[20]

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[19] A fuller set of coefficients are provided in Appendix Table F-8.

[20] See Appendix B for a description of how these adjustments were made.

The immunization compliance rates for all beneficiaries in the PCN and control counties in 1990 and 1993 broken out by vaccine type and eligibility group are shown in Table 5-21. The rates are all very low, suggesting that these children are either receiving their childhood immunizations through channels other than the Medicaid program or not at ail.

Table 5-21. Immunization Compliance Rates for Beneficiaries Aged 2-30 Months by Vaccine Type and Eligibility Group in PCN and Control Counties, 1990 and 1993

	PCN Counties		Control Counties		Difference in Differences
	1990	1993	1990	1993	
All aged 2-30 mos					
DTP	29.2	38.6	15.8	25.7	-0.5
OPV	29.4	41.0	15.1	25.3	1.4
MMR'	17.6	33.0	8.7	20.6	3.5
Combined	27.7	38.6	14.6	24.8	0.7
4FDC eligibles					
DTP	28.2	37.7	12.5	24.3	-2.3
OPV	27.5	39.4	12.1	22.8	1.2
MMR'	17.3	33.3	7.8	19.8	4.0
Combined	26.2	37.4	11.6	22.9	-0.1
SSI eligibles					
DTP	15.1	47.2	5.3	10.9	26.5
OPV	13.4	49.1	3.3	8.6	30.4
MMR'	a.4	29.0	6.9	17.0	10.5
Combined	13.2	43.9	4.9	11.3	24.3
Other eligibles					
DTP	30.0	39.2	19.2	27.0	1.4
OPV	30.7	42.0	18.4	27.4	2.3
MMR'	18.0	32.8	9.9	21.5	3.2
Combined	28.9	39.4	17.9	26.4	2.0

' Restricted to children aged 15 to 27 months.

Again, the PCN counties had higher completion rates than control counties; in 1990, 28 percent of children aged two to 30 months had received their recommended immunizations through the Medicaid program compared to 15 percent of these children in control counties. Children were more likely to be in compliance for the DTP and OPV immunizations than the MMR immunization, and children enrolled under SSI-related eligibility categories were less likely to be in compliance than children enrolled under other eligibility categories.

Children received more of their recommended childhood immunizations through the Medicaid program in 1993 than in 1990. The completion rates rose more than 10 percentage points on average in both PCN and control counties; approximately 39 percent of children aged two to 30 months in PCN counties and 25 percent of these children in control counties had received the recommended doses of the three childhood immunizations under Medicaid in 1993.

There was a marked difference in the change in immunization completion rates among SSI-related beneficiaries. In PCN counties, the combined completion rate for the three immunizations among children aged two to 30 months enrolled under SSI-related eligibility categories rose almost 3 1 percentage points from 13 percent in 1990 to 44 percent in 1993. In the control counties, a much smaller increase of six percentage points occurred-from 5 percent in 1990 to 11 percent in 1993. However, SSI-related beneficiaries comprise a very small portion of the Medicaid child population in the two-to-30-month age range and, as a result, have little impact on the overall immunization completion rates for Medicaid children in PCN counties.

As found in the multivariate analysis, shown in Table 5-22, the PCN program did not improve compliance with AAP immunization schedules.[21] In fact, a significant, negative coefficient was found for the county-wide program impact, but the negative impact was restricted to nonparticipants and children participating in the PCN program only part of the year. Thus, although immunizations paid through Medicaid may have increased over the study period, there was no evidence that the PCN program did better than the FFS program in immunizing young children.

5.2.3 Pap Smears

We also looked at the rate at which women in child-bearing ages (19 to 39 years) received an annual pap smear. Similar to other preventive care measures in our analysis, all the percentages of women who had a pap smear in the analysis years were extremely low, ranging from less than 10 percent for SSI women to slightly under one-quarter of women in the expansion eligibility category in 1990 (Table 5-23).

Furthermore, the percentage of women with pap smears was higher in PCN counties than in control counties and increased from 1990 to 1993 in all eligibility categories and both county groups. The hugest increases over time occurred in PCN counties. Thus, the discrepancy

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[21] A fuller set of coefficients are provided in Apperdix Table F-9.

widened between the two county groups over the study period, suggesting that the PCN program in New Mexico had a positive effect on preventive care use.

Table 5-22. Estimated Coefficients for the Differences in the Probability of Compliance with the AAP Childhood Immunization Schedule Among Children Aged 2 to 30 Months in PCN and Control Counties from 1990 to 1993

	Probability of Compliance with the AAP Childhood Immunization Schedule
All beneficiaries in PCN counties	-.031 (-3.16)
Delayed participation	-.030* (-2.93)
Full participation	.006 (0.49)
Disenrolled during year	-.013 (-1.05)
Nonparticipant	-.045** (-4.57)

[1] Adjusted for Ambulatory Diagnostic Groups (except the preventive care group).
** $p \leq .001$
* $p \leq .01$

Table 5-23. Percentage of Female Beneficiaries Aged 19-39 Years with a Pap Smear by Eligibility Group in PCN and Control Counties, 1990 and 1993

	PCN Counties		Control Counties		Difference in Differences
	1990	1993	1990	1993	
All women 19-39 yrs					
AFDC	18.0	21.3	10.1	10.9	2.5
SSI	9.7	15.3	7.2	7.7	5.1
Other	24.6	36.9	22.6	27.1	7.8

A significant, positive impact of the program on women's receipt of an annual pap smear was confirmed in the multivariate analysis.[22] As shown in Table 24, although the overall impact of the program on the receipt of pap smears in the county was not statistically significant, the impact on women who participated in the program during their entire Medicaid enrollment in

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[22] A fuller set of coefficients are provided in Appendix Table F-10.

**Table 5-24. Estimated Coefficients for the Differences in the Probability of an
Annual Pap Smear Among Female Beneficiaries Aged 19-39 Years of Age
in PCN and Control Counties from 1990 to 1993**

| | Probability of an Annual Pap Smear | |
	AFDC & Other Non-SSI Adults	SSI Adults
All beneficiaries in PCN counties	.018 (2.07)	.044 (2.23)
Delayed participation	.023 (2.08)	.043 (1.36)
Full participation	.044** (4.35)	.064* (2.61)
Disenrolled during year	-.001 (-0.13)	.047 (1.46)
Nonparticipant	-.017 (-1.52)	.031 (1.26)

[1] Adjusted for Ambulatory Diagnostic Groups.
** p ≤ .001
* p ≤ .01

1993 was significant. Nevertheless, the impact was small. Full PCN participants in AFDC and other non-SSI eligibility categories experienced a 4 percent increase, and full participants in the SSI category experienced a 6 percent increase.

5.3   Patterns of Health Service Use

We also looked for program impacts on the use of outpatient laboratory and radiology services, outpatient medications, and both non-delivery and delivery-related inpatient care.

5.3.1   Laboratory and Radiology Services

The percentage of beneficiaries with any laboratory or radiology services and the number of ambulatory care days with laboratory or radiology services per beneficiary with at least one such service are shown in Table 5-25. In both study years and all eligibility groups, the percentage of beneficiaries with laboratory and radiology services was higher in PCN counties than in control counties. In addition, beneficiaries in PCN counties with these services had a greater number of laboratory and radiology services per beneficiary than beneficiaries in control counties.

Changes in the use of laboratory and radiology services from 1990 to 1993 within the county groups were small. However, the changes were often in opposite directions in the two groups thereby widening the differences between the county groups. In PCN counties, except for other non-SSI adults and children, the percentage of beneficiaries with any laboratory and

radiology services fell slightly while the number of ambulatory care days with laboratory or radiology services per beneficiary with these services either edged upward or was unchanged in all county groups. Similar trends were seen in the control counties only for adults in AFDC- and SSI-related eligibility groups.

Table 5-25. Percentage of Beneficiaries with at Least One Ambulatory Care Day with Laboratory and Radiology Services and Number of Ambulatory Care Days with Laboratory or Radiology Services per Beneficiary with These Services by Eligibility Category in PCN and Control Counties, 1990 and 1993

	PCN Counties		Control Counties		Difference in
	1990	1993	1990	1993	Differences
Percentage of Beneficiaries with Ambulatory Care Days with Laboratory or Radiology Services					
AFDC Children	42.5	41.5	27.1	27.5	-1.4
SSI Children	57.5	56.4	32.7	36.2	4.6
Other Children	33.5	36.7	25.5	24.6	4.1
AFDC Adults	72.2	70.7	50.9	49.7	-0.3
SSI Adults	56.0	52.8	43.3	39.2	0.9
Other Adults	85.6	89.6	86.7	74.0	16.7
Number of Ambulatory Care Days with Lab or Xray Services per Beneficiary with These Services					
AFDC Children	1.9	2.0	1.8	1.8	0.1
SSI Children	2.8	3.0	2.6	2.3	0.5
Other Children	1.8	1.8	1.6	1.7	-0.1
AFDC Adults	2.9	3.2	2.8	2.9	0.2
SSI Adult	3.9	4.6	3.6	3.9	0.4
Other Adult	3.1	4.3	3.0	4.0	0.2

Few significant results were found in the multivariate analyses as shown in Table 5-26; no significant effects were found at the county level.[23] The PCN program had a significant, positive impact on the likelihood that adult SSI beneficiaries who participated in the program had any outpatient laboratory and radiology services. Furthermore, children who disenrolled from the PCN program in 1993 were less likely to have had any outpatient laboratory or radiology services. We found no other significant effects of the PCN program on either the likelihood or number of these services among Medicaid beneficiaries.

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[23] A fuller set of coefficients are provided in Appendix Tables F-1 1 and F-1 2.

Table 5-26. Estimated Coefficients for the Differences in the Probability and
Number of Ambulatory Care Days with Laboratory or Radiology Services
Among Beneficiaries with Ambulatory Care Days in PCN and Control Counties from 1990 to 1993

	Probability of Any Laboratory or Radiology Services[1]			Number of Ambulatory Care Day with Lab or Xray Services/User		
	Children	AFDC & Other Non-SSI Adults	SSI Adults	Children	AFDC & Other Non-SSI Adults	SSI Adults
All beneficiaries in PCN counties	-.020 (-2.38)	-.007 (-0.42)	.036 (1.64)	.005 (.036)	-.005 (-0.24)	.040 (1.08)
Delayed participation	-.014 (-1.43)	-.024 (-1.29)	.106* (3.37)	-.020 (-1.22)	-.008 (-0.32)	-.045 (-0.94)
Full participation	-.011 (-1.23)	.005 (0.30)	.108** (4.41)	,032 (2.03)	.022 (0.95)	.050 (1.25)
Disenrolled during year	-.036** (-3.66)	.006 (0.34)	.065 (2.08)	-.015 (-0.86)	-.051 (-2.00)	.017 (0.35)
Nonparticipant	-.023 (-2.23)	-.020 (-1.00)	-.051 (-2.11)	.007 (0.37)	-.001 (-0.02)	.089 (1.99)

[1] Adjusted for Ambulatory Diagnostic Groups.
** p ≤ .001
* p ≤ .01

5.3.2 Medications

For all eligibility categories in 1990 and 1993, higher percentages of beneficiaries in PCN counties had claims for outpatient medications compared to beneficiaries in control counties (Table 5-27). For AFDC- and SSI-related eligibility categories, the difference exceeded 20 percentage points. In addition, PCN beneficiaries with medication claims in all eligibility categories, except adults enrolled under other non-SSI criteria, had slightly greater numbers of claims per beneficiary compared to beneficiaries in control counties.

The percentage of beneficiaries with claims for medications increased from 1990 to 1993 in all eligibility and county groups, except for other beneficiaries in control counties. The percentage of other adults with any medication claims in control counties declined from 76 percent in 1990 to 63 percent in 1993, widening the gap between PCN and control counties in this measure and thereby making the gap comparable to that found for other eligibility groups. The number of medication claims per beneficiary with these claims increased from 1990 to 1993 in all eligibility and county groups, maintaining differences between county groups.

**Table S-27. Percentage of Beneficiaries with at Least One Medication and
the Number of Medications per Beneficiary with Medications
by Eligibility Group in PCN and Control Counties, 1990 and 1993**

| | PCN Counties | | Control Counties | | Difference in |
	1990	1993	1990	1993	Differences
Percentage of Beneficiaries with Medications					
AFDC Children	53.4	60.4	33.7	40.2	0.5
SSI Children	65.4	71.0	40.3	48.1	-2.2
Other Children	57.6	62.3	44.6	43.9	5.4
AFDC Adult	64.0	65.8	39.5	43.5	-2.2
SSI Adult	74.0	74.7	44.3	48.2	-3.2
Other Adult	79.8	80.5	76.1	62.9	13.9
Number of Medication Claims Per Beneficiary with Medications					
AFDC Children	4.8	6.1	4.2	5.3	0.2
SSI Children	12.3	12.7	9.8	11.0	-0.7
Other Children	4.9	6.2	4.2	5.2	0.3
AFDC Adult	9.7	10.5	8.0	8.6	0.2
SSI Adult	23.5	28.9	19.4	23.1	1.7
Other Adult	6.2	6.6	5.2	7.0	-1.4

In the multivariate analysis, the results of which are shown in Table 5-28, we found PCN beneficiaries in 1993 to be significantly less likely to have any claims for medications compared to beneficiaries in control counties.[24] However, the effect for program participants was small and not significant. Only those beneficiaries not participating in the PCN program in 1993 were significantly less likely to have had any medication claims.

The impact of the program on the number of outpatient medication claims per user adjusted for ADGs was not significant at the county level. Among SSI adults, the PCN program had a significant, negative effect for participants and a significant, positive effect for nonparticipants. That is, beneficiaries with any claims for medications had fewer medications on average if they participated in PCN and more medications on average if they did not.

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[24] A fuller set of coefficients are provided in Appendix Tables F-l 3 and F-l 4.

**Table S-28. Estimated Coefficients for the Differences in the Probability and
Number of Medications in PCN and Control Counties from 1990 to 1993**

	Probability of Any Medications[1]			Number of Medications/User[2]		
	Children	AFDC & Other Non-SSI Adults	SSI Adults	Children	AFDC & Other Non-SSI Adults	SSI Adults
All beneficiaries in PCN counties	-.037** (-4.93)	-.058** (-4.31)	-.036* (-2.81)	-0.12 (-0.86)	-.021 (-0.84)	.015 (0.42)
Delayed participation	-.018 (-2.00)	-.030 (-1.77)	.042 (1.81)	-.044* (-2.78)	-.044 (-1.45)	-.334** (-5.85)
Full participation	-.005 (-0.60)	-.010 (-0.66)	.040 (2.43)'	.018 (1.22)	.043 (1.54)	-.142* (-3.37)
Disenrolled during year	-.019 (-2.06)	-.032 (-1.80)	.027 (1.14)	-.028 (-1.70)	-.041 (-1.33)	-.214** (-3.78)
Nonparticipant	-.100** (-11.36)	-.145** (-9.12)	-.073** (-5.38)	006 (-0.38)	-.104* (-3.17)	.140** (3.79)

[1] Not adjusted for Ambulatory Diagnostic Groups.
'Adjusted for Ambulatory Diagnostic Groups.
** p ≤ .001
* p ≤ .01

5.3.3 Non-Delivery Hospital Stays

In contrast to ambulatory care use measures, hospital use was not consistently higher in PCN counties compared to control counties. In 1990, the PCN counties had a higher percentage of beneficiaries with non-delivery hospitalizations in the AFDC-related eligibility categories only and a greater average number of hospital days for non-delivery stays only among AFDC children and other adults (Table 5-29). There was little differeɹce between the county groups in the number of non-delivery hospital stays per beneficiary with stays.

The percentage of beneficiaries with non-delivery hospital stays and the total number of days per beneficiary for these stays increased in some eligibility categories and declined in others from 1990 to 1993 in both sets of counties. The most consistent trend occurred among SSI beneficiaries who were more likely to have had at least one non-delivery stay and had significantly more non-delivery hospital days in 1993 compared to 1990 in both county groups.

Table 5-29. Percentage of Beneficiaries with at Least One Non-Delivery Hospital Event and the Number of Non-Delivery Hospital Events and the Total Number of Hospital Days for Non-Delivery Hospitalizations per Beneficiary with Non-Delivery Hospital Events by Eligibility Group in PCN and Control Counties, 1990 and 1993

	PCN Counties		Control Counties		Difference in Difference
	1990	1993	1990	1993	
Percentage of Beneficiaries with Non-Delivery-Related Hospital Events					
AFDC Children	3.3	3.5	3.0	3.9	-0.7
SSI Children	11.9	16.5	14.4	16.2	2.8
Other Children	4.8	4.1	5.3	6.0	-1.4
AFDC Adult	6.6	5.9	4.9	4.8	-0.6
SSI Adult	8.1	11.2	8.6	10.1	1.6
Other Adult	3.4	5.3	4.7	2.3	4.3
Number of Non-Delivery-Related Hospital Events Per Beneficiary with Non-Delivery-Hospitalizations					
AFDC Children	1.2	1.2	1.2	1.2	0.0
SSI Children	1.4	1.5	2.0	1.6	0.5
Other Children	1.2	1.2	1.2	1.2	0.0
AFDC Adult	1.2	1.2	1.2	1.2	0.0
SSI Adult	1.6	1.5	1.5	1.6	-0.2
Other Adult	1.1	1.2	1.0	1.1	0.0
Number of Hospital Days for Non-Delivery-Related Hospital Events Per Beneficiary with Non-Delivery-Related Hospitalization					
AFDC Children	9.1	11.8	8.9	10.9	0.7
SSI Children	11.2	48.2	25.4	41.1	21.3
Other Children	5.9	4.4	8.1	6.5	0.1
AFDC Adult	6.1	6.1	6.7	7.8	-1.1
SSI Adult	13.0	32.5	15.5	26.1	8.9
Other Adult	16.9	4.0	7.5	6.1	-11.5

The results of the multivariate analysis show child beneficiaries participating in the PCN program were significantly less likely to have had a non-delivery stay (Table 5-30).[25] Furthermore, hospitalized children who disenrolled from PCN or who never participated in the program had significantly more non-delivery-related hospital days compared to similar beneficiaries for whom the program was not available even after adjusting for ADGs. On the other hand, the PCN program had no significant effect at the county level on hospital use among adults. However, it did have a significant, positive impact on the likelihood that participating SSI adults had a non-delivery hospitalization. Furthermore, like children, only disenrollees and nonparticipants had significantly higher numbers of hospital days for non-delivery stays among SSI adults.

Table 5-30. Estimated Coefficients for the Differences in the Probability of
Any Non-Delivery-related Hospital Stays and the Number of Non-Delivery-related
Hospital Days in PCN and Control Counties from 1990 to 1993

	Probability of Any Non-Delivery-related Hospital Stays[1]			Number of Non-Delivery-related Hospital Days/User[2]		
	Children	AFDC & Other Non-SSI Adults	SSI Adults	Children	AFDC & Other Non-SSI Adults	SSI Adults
All beneficiaries in PCN counties	-.007* (-3.10)	-.002 (-0.49)	.012 (1.76)	.251** (3.38)	.198 (2.37)	.249 (2.49)
Delayed participation	-.008* (-3.15)	.001 (0.13)	.056** (4.38)	.168 (1.93)	.276* (2.75)	-.040 (-0.29)
Full participation	-.010** (-4.44)	-.004 (-0.78)	.046** (4.93)	.106 (1.23)	.150 (1.59)	-.103 (-0.94)
Disenrolled during year	-.004 (-1.45)	.001 (0.24)	.090** (6.52)	.363** (4.12)	.207 (2.03)	.354** (2.61)
Nonparticipant	-.002 (-0.56)	-.007 (-1.13)	-.016 (-2.26)	.410** (4.45)	.166 (1.40)	.648** (5.83)

[1] Not adjusted for Ambulatory Diagnostic Groups.
[2] Adjusted for Ambulatory Diagnostic Groups.
** $p \leq .001$
* $p \leq .01$

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[25] A fuller set of coefficients are provided in Appendix Tables F-15 and F-16.

5.3.4 Delivery-related Hospital Stays

A slightly greater percentage of women in PCN counties had delivery-related hospitalizations in 1990 compared to control counties. This difference was almost entirely attributable to pregnant women enrolled under the other non-SSI expansion category. By 1993, the percentage of women enrolled in Medicaid with delivery-related hospitalizations edged up in all eligibility and county groups. The greatest increase occurred among expansion-related beneficiaries in control counties, substantially narrowing the differences in this measure between the two county groups.

As shown in Table 5-3 1, there was a small trend toward shorter lengths of stay for delivery-related hospitalization in the PCN counties that was not evident in the control counties. However, this trend does not appear to be related to the PCN program. We ran multivariate analyses on delivery-related hospital use among AFDC and other non-SSI Medicaid women aged 19-39 years. Although the program variables had negative coefficients, none was statistically significant (Table 5-32).[26]

5.4 Medicaid Expenditures

We also investigated whether the changes in access and service use induced by the PCN program resulted in higher or lower Medicaid payments. The average Medicaid payments per beneficiary are presented by eligibility category, county group, and year in Table 5-33. To eliminate the effect of fee increases, we computed a fee index to inflate the 1990 payments amounts to 1993 dollars. The fee index is based on a weighted set of common procedure codes billed for Medicaid children and adults.

We found that fees increased nearly 12 percent in New Mexico over the study period. However, Medicaid payments grew an additional 23 percent in PCN counties and an additional 29 percent in control counties. Thus, the PCN program may have reduced the growth in Medicaid expenditures in New Mexico by as much as 6 percentage points over the study period, or 2 percentage points a year from 1990 to 1993. The greatest reduction in the growth rate for Medicaid payments attributable to the PCN program were among SSI children. AFDC adults in PCN counties actually had a significantly higher rate of increase in payments compared to AFDC adults in control counties.

5.4.1 Any Payments and Payments Per User

The estimated normalized probit coefficients for the program variables in the equation for the probability of having any payments and the OLS coefficients for these variables in the equation for the log of total payments conditional on having positive payments are shown in Table 5-34.[27] The latter equation included the ADG variables to control for differences in illness burden whereas the former equation did not. Similar to our findings on other variables where we

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[26] A fuller set of coefficients are provided in Appendix Table F-I 7.

[27] A fuller set of coefficients are provided in Appendix Tables F-l 8 and F-19.

were not able to control for health status, the impact of PCN is heavily influenced by eligible beneficiaries in PCN counties who did not participate in the program. For the most part, the probit regression coefficients are negative, and while the county-level coefficient is significant, the only significant participant-level coefficients are for nonparticipants.

Table 5-31. Percentage of Female Beneficiaries with a Delivery-Related Hospital Event, and the Total Number of Hospital Days for Delivery-Related Hospitalizations by Age and Eligibility Group in PCN and Control Counties, 1990 and 1993

	PCN Counties		Control Counties		Difference in Differences
	1990	1993	1990	1993	
Percentage of Beneficiaries with Delivery-Related Hospital Events					
Age					
13-20 years	11.8	**13.6**	8.2	13.5	**-0.5**
21-30 years	**13.6**	**14.5**	12.6	15.7	**-2.2**
31-49 years	**3.1**	**3.1**	3.4	5.0	**-1.6**
Eligibility					
AFDC	**7.4**	**8.2**	**7.2**	**9.0**	-1.0
SSI	1.3	**2.5**	1.2	**1.5**	**0.9**
Other	**67.6**	**70.1**	**58.8**	**68.5**	**-7.2**
Number of Hospital Days					
Age .					
13-20 years	**3.3**	3.3	3.1	3.7	**-0.6**
21-30 years	**3.1**	3.1	3.4	3.2	**0.2**
31-49 years	**5.9**	4.3	4.4	5.5	**-2.7**
Eligibility					
AFDC	**3.3**	**3.2**	**3.4**	**3.5**	**-0.2**
SSI	**7.5**	**6.0**	**5.5**	**15.1**	**-11.1**
Other	**3.8**	**3.2**	**3. 5**	**3.5**	**-0.6**

Table S-32. Estimated Coefficients for the Differences in the Probability of Any Delivery-related Hospital Stays and the Number of Delivery-related Hospital Days Among Females Aged 19-39 Years Enrolled Under AFDC and Other Non-SSI Groups in PCN and Control Counties from 1990 to 1993

	Probability of Any Delivery-related Hospitalizations	Number of Delivery-related Hospital Days
All beneficiaries in PCN counties	.014 (0.59)	-.059 (-1.18)
Delayed participation	.021 (0.73)	-.062 (-1.02)
Full participation	.022 (0.86)	-.050 (-0.86)
Disenrolled during year	.003 (0.09)	-.102 (-1.60)
Nonparticipant	-.009 (-0.25)	-.014 (-0.21)

[1] Not adjusted for Ambulatory Diagnostic Groups.
'Adjusted for Ambulatory Diagnostic Groups.
**pi .001
* p ≤ .01

**Table 5-33. Average Medicaid Payments per Beneficiary by Eligibility Category
in PCN and Control Co&ties, 1990 and 1953**

	PCN counties				Control Counties				
	(1) 1990 Actual	(1) 1990 in 1993 $s	(2) 1993 Actual	Percent Change (2)/(1)	(1) 1990 Actual	(1) 1990 in 1993 $s	(2) 1993 Actual	Percent Change (2)/(1)	Difference in Percentage Changes
AFDC children	$328	$367	$658	79.3	$279	$313	$552	76.9	2.4
SSI children	$3475	$3885	$5287	36.1	$2693	$3010	$4638	54.1	-18.0
Other children	$703	$786	$763	-2.9	$659	$737	$732	-0.6	-2.3
AFDC adults	$885	$989	$1355	37.0	$655	$732	$920	25.7	11.3
SSI adults	$2795	$3125	$3996	27.9	$1862	$2082	$2684	28.9	-1.0
Other adults	$2312	$2585	$3511	35.8	$1795	$2007	$2663	32.7	3.1
All beneficiaries	$1130	$1263	$1552	22.9	$767	$858	$1106	28.9	-6.0

**Table 5-34. Estimated Coefficients for the Differences in the Probability of
Any Medicaid Payments and the Logarithm of Total Medicaid Payments by Eligibility Group
in PCN and Control Counties from 1990 to 1993**

	Probability of Any Medicaid Payments[1]			Total Medicaid Payments[2]		
	Children	AFDC & Other Non-SSI Adults	SSI Adults	Children	AFDC & Other Non-SSI Adults	SSI Adults
All beneficiaries in PCN counties	-.032** (-5.00)	-.052** (-4.84)	-.048** (-4.38)	.199** (13.58)	.170** (5.98)	.147** (3.35)
Delayed participation	-.008 (-1.07)	-.016 (-1.17)	.022 (1.01)	.175** (10.17)	.208** (6.08)	-.279** (3.88)
Full participation	-.008 (-1.15)	-.025 (- 1.93)	-.003 (-0.19	.189** (11.48)	.150** (4.75)	-.226** (-4.27)
Disenrolled during year	-.013 (- 1.57)	-.024 (-1.60)	.019 (0.87)	.198** (11.08)	.155** (4.43)	-.093 (-1.29)
Nonparticipant	-.087** (-11.16)	-.119** (-8.79)	-.071** (-6.10)	.244** (13.39)	.178** (4.86)	.366** (8.00)

[1] Not adjusted for Ambulatory Diagnostic Groups.
[2] Adjusted for Ambulatory Diagnostic Groups.
** $p \leq .001$
* $p \leq .01$

On the other hand, the results show that at the county level, beneficiaries with some positive Medicaid payments had higher payments-that is, that the program significantly increased costs among beneficiaries receiving any Medicaid benefits in the PCN counties in 1993. Significantly increased payments were estimated for all children and AFDC and other non-SSI adults in PCN counties, regardless of their level of PCN participation. However, the program significantly reduced costs by 22.6 percent among SSI beneficiaries who participated in the program during their entire Medicaid enrollment period in 1993.

5.4.2 Counterfactual Expenditures Under Medicaid FFS

To understand the net impact of PCN on average expenditures, we used the two-part model to simulate a counterfactual scenario of what would have happened if the PCN counties remained under a FFS system in 1993. The counterfactual estimates presented in Table 5-35 combine the impact of PCN on the probability of having positive expenditures (the extensive margin) and the impact on mean expenditures conditional on having positive expenditures (intensive margin).

Table 5-35 lists separate counterfactual expenditure estimates for AFDC and other non-SSI adults, SSI adults, and children. The results for all three groups show that expenditures

would have been higher in all cases had the PCN program not been implemented: expenditures would have been 37 percent higher for AFDC and other non-SSI adults; 125 percent higher for SSI adults; and 26 percent higher for children.[28]

Table 5-35. Counterfactual Medicaid Expenditure Simulations

PCN County Beneficiaries	Actual Expenditures, 1993	Predicted Expenditures, 1993	Percent Difference
AFDC and other non-SSI adults	$1,744	$2,401	+37%
SSI adults	$4,808	$10,822	+125%
Children	$735	$925	+26%

5.5 Minority Populations

We reran the multivariate analyses on several service use measures interacting the program effect variable with the race/ethnicity categories to determine whether the program had a different impact on New Mexico's two largest minority populations-Hispanics and Native Americans.

5.5.1 Hispanics

Hispanic beneficiaries utilized fewer health care services and had lower total Medicaid payments compared to white beneficiaries in New Mexico's Medicaid program during 1990 and 1993 (see coefficients for the Hispanic indicator in the tables in Appendix F). However, the lower rate of service use and expenditures did not result in a differential impact of the PCN program on these beneficiaries compared to white beneficiaries. In additional multivariate probit and regression runs that included variables for the interactions of the PCN program variable with the race/ethnicity variables, we found that, for Hispanic children and adults enrolled under AFDC and other non-SSI eligibility categories, the PCN program's impact was similar in direction and magnitude to the impact estimated for white beneficiaries (Table 5-36).[29] For Hispanics enrolled under SSI-related categories, the program appears to have increased the length of hospital stays but had no impact on other service use or payments. This is in contrast to significant, negative effects found for several ambulatory service use and payment variables among white SSI-related beneficiaries.

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[28] To measure the ability of the two-part model we compared the actual and predicted expenditures in control counties for AFDC and other non-SSI adults, SSI adults, and children. The predicted values from these three models were respectively 40, 116, and 16 percent higher than actual, casting doubt that the actual cost savings would be as large as indicated by Table 5-35.

[29] The full regressions results are available from the authors upon request.

5.5.2 Native Americans

Native American Medicaid beneficiaries in New Mexico also used significantly fewer services and had lower Medicaid payments compared to white beneficiaries in 1990 and 1993 (Appendix F). For the most part, the direction of the PCN program's impact on Native Americans was the same as that for whites in 1993, but the magnitude of the impact differed on several measures, with Native Americans having larger estimated effects.

Both Native American and white children in PCN counties were less likely to have had a non-delivery hospital stay but had significantly more hospital days. The decline in the likelihood of a hospital stay attributable to PCN was 0.9 percentage point among Native American children but only 0.4 Percentage point among white children. The PCN induced increase in the number of hospital days was more than 50 percent among Native American children but only 25 percent among white children. Similarly, the probability that Native American children had any medications paid by Medicaid declined 10.2 percentage points while it declined 2.4 percentage points for white children living in PCN counties compared to children residing in control counties.

The PCN program had less of an impact among adult beneficiaries in general and Native American adults in particular in 1993, with a few exceptions. Native American adults enrolled under AFDC and other non-SSI eligibility categories in PCN counties were 3.3 percentage points more likely to be hospitalized compared to beneficiaries in control counties. The program did not have a significant effect on the likelihood of non-delivery hospitalizations among white beneficiaries. Native American adults in the AFDC and other non-SSI eligibility categories also had a significantly larger drop attributable to the program in the likelihood of having any medications paid by Medicaid (12.3 percentage points) compared to whites (5.2 percentage points). Among the SSI-related beneficiaries, Native Americans had a greater decrease in the likelihood of any ambulatory days of care and equal declines in the likelihood of any covered medications or medical payments.

The impact of the PCN program on Native Americans may have changed dramatically after the July 1994 implementation of PCN in McKinley and San Juan Counties in which the Navajo Reservation is located. Native Americans can elect the MS as their PCP. In addition, Native American beneficiaries can self-refer to the IHS. Previously, the IHS had no incentive to see Medicaid patients because they could not keep surplus revenues, but now they may keep additional revenues generated from third-party sources (RTI, 1997). At the time of the site visits (fall 1994), State workers had noted an increase in Medicaid bills from MS facilities.

Table 5-36. Normalized Probit and Ordinary Least Squares Regression Coefficients for the Interaction of the Program and Race-Ethnicity Variables in Selected Service Use and Payments Equations

	Children	AFDC & Other Non-SSI Adults	SSI Adults
Any Ambulatory Days of Care[1]			
Hispanic	-.031**	-.052**	.004
	(-4.39)	(-4.12)	(0.17)
Native **American**	-.019	.031	-.080**
	(-1.42)	(1.24)	(-3.80)
Other radethnicity	.001	-.080**	-.001
	(0.05)	(-3.54)	(-0.06)
White	-.040**	-.059**	-.038*
	(-4.67)	(-3.81)	(-2.61)
Number of Ambulatory Care Days[2]			
Hispanic	.112**	.116**	.122
	(11.90)	(6.55)	(2.08)
Native **American**	.098**	.072	-.043
	(5.59)	(2.11)	(-0.90)
Other race/ethnicity	.069**	.072	.121*
	(4.34)	(2.20)	(2.84)
White	.110**	.117**	.126**
	(9.79)	(5.57)	(3.48)
Any Non-Delivery Hospital Stays[1]			
Hispanic	-.009**	-.003	.024
	(-3.97)	(-0.58)	(1.75)
Native **American**	.001	.033*	.009
	(0.24)	(2.67)	(0.84)
Other race/ethnicity	-.004	.005	.012
	(-1.07)	(0.52)	(1.24)
White	-.004	-.008	.012
	(-1.33)	(-1.28)	(1.59)
Number of Non-Delivery Hospital Days[2]			
Hispanic	.199*	.173	.656**
	(2.47)	(1.91)	(3.74)
Native **American**	.528**	.149	.212
	(4.09)	(0.95)	(1.41)
Other racdethnicity	.367*	.104	.207
	(3.08)	(0.63)	(1.57)
White	.253*	.282*	.207
	(2.71)	(2.66)	(1.91)
Any Medications[1]			
Hispanic	-.039**	-.056**	.012
	(-4.97)	(-3.87)	(0.51)
Native **American**	-.102**	-.123**	-.065*
	(-6.85)	(4.39)	(-3.13)
Other racdethnicity	-.021	-.052	.008
	(-1.52)	(-2.01)	(0.48)
White	-.024*	-.052*	-.060**
	(-2.53)	(-3.01)	(-4.11)

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	Children[1]	AFDC & Other Non-SSI Adults	SSI Adults
Number of Medications[1]			
Hispanic	-.012	-.027	.116
	(-0.80)	(-1.01)	(1.74)
Native American	-.019	.016	-.040
	(-0.61)	(0.25)	(-0.74)
Other race/ethnicity	.003	-.169	.072
	(0.10)	(-1.20)	(1.58)
White	-.015	-.003	-.006
	(-0.88)	(-0.09)	(-0.15)
Any Medicaid Payments[1]			
Hispanic	-.034**	-.051**	-.000
	(-5.00)	(4.28)	(-0.01)
Native American	-.024	.015	-.086**
	(-1.84)	(0.66)	(-4.53)
Other race/ethnicity	-.005	-.061*	-.003
	(-0.46)	(-2.93)	(-0.20)
White	-.039**	-.067**	-.070**
	(-4.78)	(-4.56)	(-5.61)
Total Medicaid Payments[2]			
Hispanic	.206**	.191**	.181
	(13.18)	(6.29)	(2.25)
Native American	.161**	.056	-.009
	(5.53)	(0.95)	(-0.14)
Other race/ethnicity	.108**	.130	.165*
	(4.08)	(2.31)	(2.93)
White	.222**	.150**	.174**
	(11.92)	(4.15)	(3.66)

[1] Not adjusted for Ambulatory Diagnostic Groups.
[2] Adjusted for Ambulatory Diagnostic Groups.
** $p \leq .001$
* $p \leq .01$

6.   Summary and Conclusion

6.1 Enrollment

Although the PCN program was intended to be mandatory for all Medicaid beneficiaries in New Mexico with the exception of a few eligibility categories, in practice, one third of eligible beneficiaries did not participate in 1993 and another third participated for less than their full Medicaid enrollment period. Beneficiaries who participated in the program differed from nonparticipants in ways that significantly affect health service use and expenditures.

Infants, the elderly, and beneficiaries residing in rural counties were less likely to participate in PCN in 1993. On the other hand, minority populations were as likely or more likely to participate, and beneficiaries with greater health care needs were more likely to participate. The elderly, Native Americans, and beneficiaries residing in rural areas had an increased likelihood of terminating their participation before ending their Medicaid enrollment in 1993. Health care status was not a major determinant of PCN disenrollment.

6.2   Service Use and Expenditures

We investigated the impact of the PCN program at two levels: (1) the group of PCN counties as a whole, and (2) PCN participants in the counties offering the program.

6.2.1 County Impact

The county-level results from the multivariate analyses are summarized in Table S-37; the existence and direction of significant coefficients for the program impact variable in each of the service use equations are indicated. What these estimated impacts tell us about the success of the PCN program in meeting the four objectives listed above are discussed in turn below.

Access to Primary Health Cure. Our analysis shows that the PCN program improved access to care among Medicaid children. Although there was a significant reduction in the probability of any ambulatory care, children who had some care had significantly more days of care. In addition, there was no indication that children were receiving less adequate care than under FFS Medicaid. Two measures indicative of the lack of adequate primary health care-emergency room visits and ACSC hospitalizations— were significantly reduced among children in the PCN counties in 1993 relative to control children. Furthermore, Medicaid children in PCN counties in 1993 were more likely to be referred for further diagnosis and treatment during EPSDT visits even after controlling for case-mix.

Table S-37. Summary Results of the County-level Impact of the PCN Program on Selected Measures by Eligibility Category

	Children	AFDC & Other Non-SSI Adults	SSI Adults
Improving Access to Care			
Any ambulatory days of care'			**0**
Number of ambulatory days among users[2]	+	+	+
Any ER visits'		**0**	**0**
Number of days with ER visits among users[2]		**0**	**0**
Any hospitalizations for ACS conditions'			**0**
Referrals during EPFDT visits'	+	n.a.	n.a.
Promoting Preventive Care			
Compliance with well-child schedule'	**0**	**n.a.**	**n.a.**
Compliance with immunization schedule[2]		n.a.	n.a.
Compliance with annual pap smears[2]	n.a.	**0**	**0**
Monitoring Patterns of Service Use			
Any ambulatorys laboratory or radiology[2]	**0**	**0**	**0**
Number of days with lab/xray among users[2]	**0**	**0**	**0**
Any claims for outpatient medications'			
Number of medication claims among users[2]	**0**	**0**	**0**
Any nondelivery hospital stays'		**0**	**0**
Number of nondelivery hospital days among users[2]	+	**0**	**0**
Number of delivery days among users[2]	n.a.	**0**	n.a.
Controlling Program Costs			
Any Medicaid payments'			
Total Medicaid payments among users[2]	+	+	+
Counterfactual expenditures			

[1] Estimated without controlling for Ambulatory Diagnostic Groups.
[2] Estimated controlling for Ambulatory Diagnostic Groups.
0 no significant effect
+ increased use or expenditures
- decreased use or expenditures

The program's effect on adults' access to care is less certain. As found for children, there was significantly fewer Medicaid adults in PCN counties with any ambulatory care in 1993, and those with care had significantly more ambulatory care days. In addition, we found no significant program effects on adults' use of emergency rooms. However, AFDC and other non-SSI adult beneficiaries in PCN counties had significantly fewer ACSC hospitalizations.

Preventive Cure Use. We found no evidence that the PCN program improved use of preventive care in the PCN counties as a whole in 1993. The coefficients for the program impact variables were not significant in the equations for compliance with the EPSDT periodicity schedule among preschool-aged children or with recommendations for annual pap smears among women in child-bearing ages. Furthermore, a significant, negative coefficient was found in the equation for compliance with immunizations among children aged two to 30 months.

Patterns of Service Use. The PCN program significantly changed the pattern of service use among children enrolled in Medicaid but had less of an impact on service patterns among adults beneficiaries. Children in PCN counties in 1993 were less likely to have any ambulatory care, any outpatient medications, and any inpatient care compared to control county children. However, if they received any ambulatory or inpatient care, Medicaid children in PCN counties had more intense care-that is, PCN county children who had ambulatory care had significantly more ambulatory days of care and hospitalized children in PCN counties had significantly more inpatient days.

The PCN program had a similar effect on the pattern of ambulatory care received by adults as it had on care received by children-it decreased the probability of any ambulatory care among AFDC and other non-SSI adult beneficiaries but increased the number of ambulatory care days among all adult beneficiaries. Adult Medicaid beneficiaries in PCN counties were also less likely to have any outpatient medications billed to Medicaid in 1993 compared to control counties. However, the program had no impact on patterns of inpatient care use among adult Medicaid beneficiaries.

Health Cure Expenditures. The PCN program resulted in fewer Medicaid beneficiaries with any payments during the year and higher payments per beneficiary among beneficiaries with some Medicaid paid claims in all three major eligibility categories. The estimated counterfactual payments suggest that the program produced net cost savings for all three eligibility groups.

6.2.2 Participant Impact

The participant-level results from the multivariate analyses are summarized in Table **5-38**; the significance and direction of the coefficients for full-period participants are shown. The estimated effects for SSI recipients must be interpreted with care because of substantial evidence that selective participation may not have been fully controlled and therefore may have introduced bias into the estimates: PCN participants in SSI-related enrollment categories had a greater illness burden than nonparticipants and therefore greater service use and costs.

Access to Primary Health Cure. Our analysis shows that the PCN program improved access to care among Medicaid children participating in the program. Program participation did

not effect the likelihood that Medicaid children had any ambulatory days of care during the year, but among those that had some days of care, program participation had a significant, positive effect. Furthermore, children participating in the program were more likely to be referred for further diagnosis and treatment during EPSDT visits even after controlling for case-mix. In addition, emergency room visits and ACSC hospitalizations were significantly reduced among children participating in the PCN program relative to control children.

Again the program's effect on adults' access to care is less clear. AFDC and other non-SSI adults with some ambulatory care had significantly more ambulatory care days and SSI adults were more likely to have had at least one ambulatory care day if they were participating in the program than if they were not. However, we found no significant program effects on adults' use of ERs or on the likelihood that they were hospitalized for ACSCs.

Preventive Cure Use. Our analysis also shows a significant, positive impact of the PCN program on the use of preventive care. Infants and toddlers participating in the program were more likely to be in compliance with national standards for well-child check-ups and women in the child-bearing age group who participated in the program were more likely to have received an annual pap smear.

We did not find any significant effects of the program on the immunization completion rates for common childhood immunizations. However, because of the very low completion rates computed from the claims data, we believe that the file may not be capturing the majority of immunizations received by Medicaid children.

Patterns of Service Use. As mentioned above, the increased ambulatory and preventive care use found among children participating in the PCN program in 1993 appears to have resulted in significantly fewer emergency room visits and hospitalizations for ACSCs. We also found a significant reduction in the probability of any non-delivery hospitalizations among children participating in the program. However, we found no statistically significant program impact on children's use of laboratory, radiology, or pharmacy services. The program also did not have significant effects on service use by AFDC and other non-SSI adults beyond the increased use of ambulatory and preventive care discussed above.

Table 5-38. Summary Results of the Impact of PCN Program Participation on Selected Measures by Eligibility Category

	Children	AFDC & Other Non-SSI Adults	SSI Adults
Improving Access to Care			
Any ambulatory days of care[1]	0	0	+
Number of ambulatory days among users*	+	+	0
Any ER visits[2]		0	0
Number of days with ER visits among users[2]		0	0
Any hospitalizations for ACS conditions[1]		0	0
Referrals during EPSDT visits[1]	+	n.a.	n.a.
Promoting Preventive Care			
Compliance with well-child schedule[1]	+	n.a.	n.a.
Compliance with immunization schedule*	0	n.a.	n.a.
Compliance with annual pap smears[2]	n.a.	+	+
Monitoring Patterns of Service Use			
4ny ambulatorys laboratory or radiology[2]	0	0	+
Vumber of days with lab/xray among users[2]	0	0	0
4ny claims for ambulatory medications[1]	0	0	0
Vumber of medication claims among users[2]	0	0	
4ny nondelivery hospital stays[1]		0	+
Vumber of non-delivery hospital days among users[2]	0	0	0
Vumber of delivery days among users[2]	n.a.	0	n.a.
Controlling Program Expenditures			
\ny Medicaid payments[1]	0	0	0
'otal Medicaid payments among users[2]	+	+	

[1] Estimated without controlling for Ambulatory Diagnostic Groups.
[2] Estimated controlling for Ambulatory Diagnostic Groups.
0 no significant effect
+ increased use or expenditures
- decreased use or expenditures

On the other hand, service use patterns differed markedly among SSI adults participating in the PCN program. Participating SSI adults were significantly more likely to have ambulatory days with laboratory and radiology services and to have non-delivery-related hospitalizations. Furthermore, among SSI adults with drug claims, PCN participation significantly reduced the number of drug claims.

Health Care Expenditures. The PCN program had a differential effect on program participants depending on eligibility category. The program was cost-increasing for children and for adults enrolled under AFDC and other non-SSI eligibility categories, but was cost-decreasing for adults enrolled under SSI-related categories. The latter group are believed to provide more opportunities for case management to improve care and reduce costs. The results of our study bears this out.

6.3   Impact on Minority Populations

The New Mexico PCN program provided an opportunity to investigate the impact of a PCCM program on two minority populations—Hispanics and Native Americans. Hispanic children and Native American SSI-related beneficiaries were more likely to participate in the PCN program, and other Native Americans although just as likely as other race/ethnicities to participate in the program were more likely to disenroll from PCN.

Although Hispanics utilized fewer health care services and had lower total Medicaid payments, the impact of the PCN program on their service use and costs for the most part was similar to that of whites. The one exception was among Hispanic SSI beneficiaries for whom the PCN program appears to have significantly increased the length of hospital stays in 1993, but to have no impact on ambulatory care use; white SSI beneficiaries were less likely to have had any ambulatory care.

Native American Medicaid beneficiaries in New Mexico also used significantly fewer services and had lower Medicaid payments compared to white beneficiaries during the study period. Nevertheless, the direction of the PCN program's impact on Native Americans was the same as that for whites in 1993, but the magnitude of the impact was larger for many services. The impact of the PCN program on Medicaid expenditures for Native Americans may have increased even more after the July 1994 implementation of PCN in the Navajo Reservation when MS facilities became the PCPs for many more Native Americans and began billing Medicaid.

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Chapter 6: Summary and Conclusions

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1. Overview

When HCFA contracted in 1993 with Research Triangle Institute and its collaborators at Indiana University and Health Economics Research to perform the evaluation of the 1915(b) waiver program, there were only slightly more than 3.5 million Medicaid beneficiaries enrolled in managed care; the enrollees were largely women and children qualified for Medicaid through AFDC or the **SOBRA** expansions. Few states had tried to enroll other eligibility categories, such as the SSI, in managed care with 1915(b) waivers, and even fewer states had yet tried expanding their Medicaid programs with 1115 waivers. As we complete our final report in 1998, the landscape has changed dramatically. Over 15.3 million Medicaid beneficiaries are enrolled in some type of managed care plan which constitutes 47.8 percent of the eligible population (HCFA, 1997). States are now moving quickly to enroll eligibility categories other than AFDC in managed care, with emphasis on the SSI and mentally ill populations, and through 1115 waivers to expand Medicaid to cover the uninsured. There also is explosive activity in the states with managed behavioral health carve outs under Medicaid.

Most recently, with the passage of the Balanced Budget Act (BBA) of 1997, the 1915(b) waiver program was altered significantly. Section 1932(a) of the Social Security Act, enacted in section 4701 of the BBA, permits States to enroll their Medicaid beneficiaries in managed care entities on a mandatory basis without either section 1915(b) or 1115 waiver authority so long as their State plan is amended appropriately and other protections for beneficiaries as are required in section 1903(m) are instituted. This development is based at least partially on the belief that since so many states now use 1915(b) waivers, and the managed care programs created because of them now constitute the "mainstream" for Medicaid in many localities, that going through the waiver process is now unnecessary and bureaucratic. As a result, this 1915(b) evaluation and the findings therein are even more important than before. This will be the first comprehensive evaluation of 1915(b) for HCFA. Since waivers no longer will be required, this may be the last such evaluation. It therefore is especially important for HCFA and the States to know the answers to several basic and important questions about the 1915(b) program as it launches into the next Medicaid managed care period. The important questions that we address regard what happens to access to care, use of services including preventive care, and cost when Medicaid beneficiaries enroll mandatorily in managed care plans in a program formed with the receipt of 1915(b) waivers. In the remainder of this summary chapter, we describe our study sites and considerations in selecting them, our particular study questions and hypotheses, data sources, analytic methods and findings across all study sites. We conclude with policy implications for policymakers and program managers.

2. Site Selection

The contract did not permit empirical assessment of all approved 1915(b) programs. Instead, we selected a sample of 1915(b) programs and populations from among those in operation as of October 1, 1993, the date our study commenced. We took several variables into account in selecting the ultimate study sites for empirical evaluation. We wanted programs that were both new and mature, that encompassed different forms of managed care, enrolled large numbers of traditionally underserved groups, and were regionally diverse. Our budget permitted us to conduct in-depth empirical analyses only in four states. As our first state we selected the

Santa Barbara, California and San Mateo, California health initiatives. Both plans are county organized systems that enroll all Medi-Cal beneficiaries in all aid categories and have done so since 198 1 and 1987, respectively. Each requires that Medi-Cal beneficiaries select a primary care gatekeeper who must authorize all of their care. Santa Barbara and San Mateo are the longest running 1915(b) managed Medicaid programs. Thus, we can begin to see whether the results from the first year of operation persist or change in later years. Our analyses of Santa Barbara and San Mateo are very important because they represent what we believe are the very first longitudinal studies of Medicaid managed care.

Montgomery County, Ohio (the Dayton area) was our second study site. In Montgomery County, the 19 15(b) program originally was mandatory for only AFDC beneficiaries. It is an example of a competing HMO model, whereby all Medicaid beneficiaries must select enrollment in one of three HMOs, one closed panel and two IPAs. Montgomery County also has a large number of African American enrollees. The Montgomery County 1915(b) program operated with voluntary enrollment until 1992, when enrollment in one of three HMOs became mandatory.

The Medipass program that we studied in Florida in the Tampa and St. Petersburg areas is an example of a 1915(b) program where a primary care case management (PCCM) model operates alongside a competing HMO model. The program only is mandatory for AFDC beneficiaries and mothers and children who qualify for Medicaid based on the SOBRA expansions. Individuals who do not elect HMOs automatically are assigned to the PCCM. We studied only the PCCM as we were unable to obtain the HMO data.

Finally, the statewide PCCM in New Mexico-our fourth study site-is an example of a state with large Hispanic and Native American populations that has little experience with managed care. It also is a state with a heavy concentration of rural counties affording us the ability to look at managed care in a rural state. Enrollment is mandatory for AFDC, SOBRA and SSI beneficiaries and was to be phased in over time in all counties across the state. As part of this study, we conducted case studies of each of our study sites in which we describe each study site, and all of its implementation and operation issues in greater detail (Research Triangle Institute, 1997).

Comparison sites always are difficult to identify because of the threat that managed care will be adopted in them before the end of the study period and because the characteristics of the enrollees or providers may be different than in the "test"sites. In selecting comparison sites, we contacted working professionals knowledgeable about the Medicaid program to obtain information about likely state developments in managed care in Medicaid. From their suggestions we selected counties that were as demographically similar to the 1915(b) sites as possible and where no managed care initiatives were slated to be implemented during the study period. After selecting each comparison site, we further used statistical matching methods to ensure greater comparability. Our comparison sites were as follows, Ventura County, California (for both Santa Barbara and San Mateo), Summit County (the greater Akron area), Ohio, a four-county area around Orlando, FL and counties which had yet to be phased into the 1915(b) program in New Mexico.

A full description of the managed care programs in each of the study sites can be found in our case study reports also prepared as part of this contract.

3.   Study Questions

We conducted empirical analyses to test hypotheses in four related and complementary areas; access to care, prevention, utilization and expenditure control (cost from HCFA's perspective). In every instance, we provide analyses for both children and adults and by eligibility category. All sites enrolled AFDC beneficiaries in their managed care program and Santa Barbara, San Mateo, and New Mexico enrolled SSI beneficiaries too. We hypothesized that access to primary care would improve but made no hypotheses about access to other kinds of care such as that from specialists; that managed care in Medicaid would promote the use of preventive services and increase their provision in comparison to FFS; that service utilization patterns would be altered as a result of managed care leading to greater emphasis on primary care and less on hospital care, particularly for ambulatory care sensitive conditions (ACSC); and that managed care would control expenditures. We were precluded from directly testing hypotheses regarding the impact of managed Medicaid on any aspect of quality of care (including satisfaction with care) because we were limited to the use of claims and encounter data in our analyses. We did not have resources to either survey individuals or engage in record abstraction.

For each hypothesis, we report findings for both children and adults and for both SSI and non-disabled eligibility categories. Further, findings are presented when the county or cluster of counties studied is the unit of analysis and by participation level. The county level (which hereafter refers to both the sites where both single and multiple county clusters were involved) analyses, for example, answer the question of whether there are cost savings, utilization changes, etc. due to managed care even when not all individuals who were required to enroll actually enroll and when those who enroll stay in only for a part of their eligibility on Medicaid. In the chapters describing the state specific findings, we performed separate analyses for different participation levels—those individuals continuously participating in managed care during their Medicaid enrollment period, those with delayed participation in managed care, those who disenrolled from managed care prior to the end of the year or their Medicaid enrollment period, and those who were eligible but did not participate in managed care. In so doing, we directly confront the fact that Medicaid beneficiaries have different patterns of exposure to managed care during a year, with potentially different impacts on access, use and therefore cost. This study is the first we know of to systematically breakout differences in outcome by participation level. Previous studies have concentrated on Medicaid beneficiaries who have enrolled continuously in managed care all year. The continuously enrolled is an important group for at least two reasons. First, they comprise about 30-40 percent of the total population and therefore represent significant expenditures. Second, they are the group whose experience in managed care may best approximate individuals enrolled in managed care in the private sector, as the latter are generally not permitted to disenroll from or switch managed care except once a year during open enrollment or at termination of employment.

4. Data Sources and Analytical Approach

We drew our data from several sources. Eligibility and enrollment data were acquired from each state's Medicaid program and merged with utilization and expenditure data summarized at the person level from claims or encounter records acquired from different sources. For the managed care programs in California, sites were required to report "dummy claims" to the Medi-Cal program for the latter's use in rate setting. We acquired the "dummy claims" to use in our analyses. In Ohio, the encounter data came directly from the managed care organizations. Because providers were paid on a fee-for-service (FFS) basis under the Florida and New Mexico PCCM programs, claims data for these programs came from the state Medicaid Management Information Systems (MMIS).

Utilization data for the comparison groups were claims data from the states' MMIS, except in California where we used data from the Tape-to-Tape project. For all but the California sites, we collected data on the year immediately prior to implementation of the 1915(b) program and an early operational year, which allowed us to use a **difference-in-**differences approach in our statistical analyses for these three states. The **differences-in-**differences regression model allows each study and comparison site to be used as its own control, and thus implicitly asks the questions whether the changes being observed are larger or smaller in one location than the other, everything else being the same. We used a slightly different approach in Santa Barbara, San Mateo and Ventura, where we collected information on all individuals ever eligible in these counties for Medi-Cal between 1987 and 1992. Using this information, we constructed panel data sets and conducted our statistical tests using regression methods developed in recent years specifically for longitudinal panel data analysis.

5. Findings

Tables 6- 1 to 6-3 include summary information from most of our regression results, indicating whether there was a statistically significant impact of enrollment in a mandatory 1915(b) program versus the FFS comparison sites. Separate results are presented by area of study (promoting access, promoting prevention, patterns of service use, expenditure control) for non-disabled children and adults, and SSI children and adults (Table 6-3) taking both the county/county cluster and continuously enrolled perspectives. The category non-disabled included those who qualify under AFDC as well as SOBRA and other expansions. A "+" sign in Tables 6-l to 6-3 indicates the program effect was an increase in the measure of less than 5 percent; "++" indicates a 5-10 percent increase, "+++" a greater than 10 percent increase, "-" a less than 5 percent decrease, "--" a 5-10 percent decrease, and "---" a greater than 10 percent decrease; "0" means there was no statistically significant program effect and blank indicates that no program effect was estimated for that variable.

We estimated different program effects in different states because each state extended its 1915(b) program to differing eligibility groups; in all analyses we analyzed the experience of children and adults separately. In the California counties, program impacts for AFDC children and adults were separated from the impacts on other non-SSI children and adults and on SSI children and adults. In Ohio, only AFDC recipients were included in our analysis. In Florida, we

	Adult					Child				
	SM	SB	OH	FL	NM¹	SM	SB	OH	FL	NM
Improving Access to Care										
Any ambulatory days of care		—	0	0	-	- -		0	+	-
No. of ambulatory care days among users			0	++	++			0	-	++
Monthly ambulatory care days	---	—				—	—			
Any ER visits among ambulatory users			0	-	0			0	--	
Number of ER visits among ER users			0	-	0			0	--	
Monthly ER visits		—				—	—			
Any hospitalizations for ACSCs	+★	+★				0	0			
Promoting Preventive Care										
Compliance with well-child visit schedule (2-60 months of age)	n.a.	n.a.	n.a.	n.a.	n.a.	---	+++	--	-	0
Compliance with immunization schedule (2-30 months of age)	n.a.	n.a.	n.a.	n.a.	n.a.	---	+++	0	0	-
Compliance with annual pap smears (females aged 19-39 years)	0	0	+++	-	0	n.a.	n.a.	n.a.	n.a.	n.a.
Changing Patterns of Service Use										
Any hospital stays			—					—		
No. of inpatient days among hospital users			0					0		
Any non-delivery hospital stays				0	0					
No. of non-delivery stays	m	m				m	m			
No. of non-delivery days among users	0	0		0	0	Om	0⊗		0	+++
No. of medical stays among hospital users								0		
No. of surgical stays among hospital users								0		
No. of inpatient days for deliveries (females 19-39 years)	--●	--●		0	0	n.a.	n.a.	n.a.	n.a.	n.a.
Controlling Program Expenditures										
Monthly Medicaid payments	---	—				—	---			
Any Medicaid payments during year				++	--				+++	-
Total Medicaid payments among annual users				—	+++				—	+++
Counterfactual expenditures			++	---•	—			+++	---	---

Key: 0 indicates no significant effect: - a less than 5% decrease: -- a 5-10% decrease; --- a greater than 10% decrease: + a less than 5% increase; ++ a 5-10% increase; and +++ a greater than 10% increase.

¹ Includes disabled children.

★ Results differ for AFDC and other non-disabled enrollees; we found + for AFDC and 0 for other non-disabled.

⊗ Results differ for AFDC and other non-disabled enrollees; we found 0 for AFDC and - for other non-disabled.

● Results differ for AFDC and other non-disabled enrollees; we found - for AFDC and 0 for other non-disabled.

m Results differ for AFDC and other non-disabled enrollees; we found mixed + and - for other non-disabled.

Table 6-2. Summary of Estimated Impacts for Continuously Enrolled (Full-Period) Non-Disabled Enrollees

	Adult			Child		
	OH	FL	NM	OH	FL	NM
Improving Access to Care						
Any ambulatory days of care	0	+++	0	0	+++	0
No. of ambulatory care days among users	0	++	+++	0	+	+++
Any ER visits among ambulatory users	0	—	0	0	---	
Number of ER visits among ER users	0	--	0	0	---	
Any hospitalizations for ACSCs			0			
Promoting Preventive Care						
Compliance with well-child visit schedule (2-60 months of age)	n.a.	n.a.	n.a.	0	+	++
Compliance with immunization schedule (2-30 months of age)	n.a.	n.a.	n.a.	0	+	0
Compliance with annual pap smears (females aged 19-39 years)	+++	0	+	n.a.	n.a.	n.a.
Changing Patterns of Service Use						
Any hospital stays	---			---		
No. of inpatient days among hospital users	0			0		
Any non-delivery hospital stays		0	0		0	
No. of non-delivery days among users		0	0		0	0
No. of medical stays among hospital users	0			---		
No. of surgical stays among hospital users	0			0		
No. of inpatient days for deliveries (females 19-39 years)		0	0	n.a.	n.a.	n.a.
Controlling Program Expenditures						
Any Medicaid payments during year		+++	0		++t	0
Total Medicaid payments among annual users		--	+++		0	+++

Key: 0 indicates no significant effect; - a less than 5% decrease; -- a 5- 10% decrease; --- a greater than 10% decrease; + a less than 5% increase; ++ a 5-10% increase; and +++ a greater than 10% increase.

Table 6-3. Summary of Estimated Impacts for SSI Recipients

	County or County Cluster					Continuously Enrolled
	Adult			Child		Adult
	SM	SB	NM	SM	SB	NM
Improving Access to Care						
Any ambulatory days of care	↘	↘	0	↘	↘	+++
No. of ambulatory care days among users			+t			0
Monthly ambulatory care days	↘	↘		↘	↘	
Any ER visits among ambulatory users			0			0
Number of ER visits among ER users			0			0
Monthly ER visits	+++	---		+++	---	
Any hospitalizations for ACSCs	0	0	0	0	0	0
Promoting Preventive Care						
Compliance with annual pap smears (**females** aged **19-39 years**)	0	0	0	n.a.	n.a.	++
Changing Patterns of Service Use						
Any non-delivery hospital stays			0			+
No. of non-delivery hospital stays	+++	m		m	m	
No. of non-delivery days among users	0		0	0	0	0
No. of inpatient days for deliveries (females 19-39 years)			0	n.a.	n.a.	
Controlling Program Expenditures						
Monthly Medicaid payments	↘	↘		↘	↘	
Any Medicaid payments during year			--			0
Total Medicaid payments among annual users			+++			---
Counterfactual expenditures			---			

Key: û indicates no significant effect; - a less than 5% decrease; -- a 5-10% decrease; --- a greater than 10% decrease; + a less than 5% increase; ++ a 5-10% increase; +++ a greater than 10% increase; and ↘ indicates that the result was first positive and became negative with longer duration.

analyzed data on AFDC and other non-SSI children and adults together. In New Mexico, the experience of all children were estimated together but SSI adults and AFDC adults combined with all other non-SSI adults were analyzed together. In the summary tables, the results for Ohio, Florida, California (AFDC only) and New Mexico are combined in tables for non-disabled populations. Where the results for the California non-SSI groups are different we so indicate. Non-SSI children or adults generally cover those eligible through SOBRA and Ribicoff expansions.

5.1   Access to Care

As is explained thoroughly in each of the previous chapters, because of the nature of claims/encounter data, we were limited to measures of utilization only. Hence our conclusions about access are preliminary and cannot be viewed as a definitive statement of managed Medicaid's impact on access. Nevertheless, very valuable information is brought to light. Specifically, an overall increase in the use of ambulatory care, coupled with an indication of lessened use of the emergency room (ER) and fewer hospitalizations for ACSC would all be consistent with our hypothesis of greater access to care.

The findings from our regression analyses on access to care across all four study sites, populations and age groups indicate mixed results. In some instances there is the suggestion of improved access and in other cases this cannot be said.

51.1 Non-disabled Children

County level analysis: There was not a consistent picture indicating that access to care has improved as a result of the managed care program. In only one case was there an increase in the probability of ambulatory care; on three occasions there was a decrease, and no change was noted in one site. Equally mixed results are found in the ambulatory use for users measure. For example, sometimes the probability of use decreased as did the numbers of ambulatory days. However, sometimes impacts went in opposite directions. There were no consistent patterns across sites.

For emergency department use a different picture emerges. In most cases there was a decrease in use or no impact on use whether measured as having one ER visit in a year or in the number of days with ER visits. In only one case, Ohio, was there no impact and there were no instances where ER use on any measure increased. Since all the sites besides Ohio used PCCM organizational models, it could be that these more open forms of managed care are better at reducing ER use, but because the Ohio analysis has a relatively small sample size we cannot conclude this with any certainly. Alternatively, because HMOs in Ohio had been in operation and open for voluntary enrollment before the 1915(b) program, it is possible that the market already had adjusted to lower levels of ER use.

In two cases, the probability of having a hospital stay for an ACSC decreased, and these were the same sites where there also was some indication of an increase in ambulatory care. Thus, there are some results that are consistent with the hypothesis of increased access to care.

Continuously enrolled: For the three states in which we estimated program impact by level of participation, when any of the program impacts for ambulatory care are statistically significant, they all go in the positive direction. Thus, there is some indication that both the probability of having an ambulatory day and the number of days goes up for children eligible through **AFDC** who are continuously enrolled. For use of the ER, the impacts are identical to those observed in the county level analyses where only decreases were observed. When there was any impact on ACSC hospitalizations, there was a decrease. In total, the results for the continuously enrolled also indicate there may have been improved access to care.

51.2 Non-Disabled Adults

County Level: In three of the study sites there was a decrease in the probability of having any ambulatory days of care; in the other two there was no impact. As for the number of days with ambulatory care there also were mixed results since there were instances of all three outcomes, negative, positive and no impacts.

As for emergency use as access measures, the results showed either no impact or reduction as was the case for non-disabled children. In particular, in only three sites did the probability of having any ER use decrease; and the same sites that showed the decline in ER use once during the year also showed an overall decrease in the number of days with ER visits. Those that showed no decrease in the probability of use also showed no change in the number of ER visits. In the two instances when there was an increase in the number of ambulatory days and some negative change in ER use, there was a concomitant decrease in the ACSC hospital measure, suggesting once again an increase in access to care. However in both California sites, the presence of decreases in ambulatory days was coupled with an increase in the probability of a hospitalization for an ACSC-an indication of deterioration in access to care.

Continuously eligible: The results were identical to those described above for continuously enrolled children.

5.1.3 SSI Children

County Level: Of the four states we studied, in only Santa Barbara and San Mateo did we separately analyze SSI children enrolled in managed care.[1] Here the findings are different than those reported for non-disabled children. Both the probability of having any ambulatory care and the number of ambulatory days declined.

In their use of ER a different pattern was observed. At first SSI children increased their use of ER, but after time a marked decrease ensued. This makes sense. SSI children are regarded as sicker than children eligible for Medicaid through **AFDC** eligibility. They always are heavier users of care. The patterns we note are consistent with individuals who are at first getting used to

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[1] We did separately estimate the impact of the New Mexico PCN program on SSI children in another paper (Gavin, Farrelly, and Simpson, 1998). We found no statistically significant impact of the program on these children's access to primary care as reflected in the selected utilization measures.

5.2.2 Non-disabled Adults

County *level:* There were mixed results for pap smears. In three cases there was no change, and in the other two sites, one indicated an increase and one a decrease.

Continuously enrolled: In two of three cases, the pap smear rate increased among continuously enrolled women; in the third site, no change in comparison to the pre period was noted.

5.2.3 SSI **Children**

We did not report results for SSI children on either preventive care measure in this report. However, we did compute preventive care results separately for SSI children in New Mexico and found no consistent, significant program effects. These results are presented in a companion paper (Gavin, Farrelly, and Simpson, 1998).

5.2.4 SSI **Adults**

County level: We had data from the two California sites and New Mexico on these measures, and in no cases were statistically significant impacts of the program noted.

Continuously enrolled: In New Mexico, where participant level impacts for SSI adults were estimated separately, we found a statistically significant increase in the pap smear rate.

5.3 **Patterns of Inpatient Service Use**

In keeping with most previous studies of the impact of both Medicaid managed care and managed care in Medicare and other privately insured populations, we looked at use rates for many different types of medical care. Here we discuss results only for a variety of hospital use measures. We hypothesized decreases in admissions and days as a result of managed care enrollment. We used different variables in the different sites, including the probability of having any hospital stays, the number of hospital stays by type among those with hospital stays, and the number of hospital days among beneficiaries with stays. For most measures, we hypothesized a decrease due to managed care.

5.3.1 Non-disabled Children

County level: We tried a variety of hospital use measures, but found few significant impacts of the managed care program on any of them. In Ohio, the research did not detect any impact on the number of surgical, medical or delivery related admissions. Similarly, a majority of the time, there was no impact on the number of hospital days in the other sites due to managed care. However, there is.some evidence that the probability of having any kind of hospital stay would decrease as it did two of the three times it was measured.

Continuously enrolled: There was a decrease in the number of medical admissions in Ohio, but no change in either delivery-related or surgical admissions. Florida data consistently

revealed no impacts on any measure of hospital use, whereas in the New Mexico counties studied, there was a decrease in the likelihood of having a non-delivery related hospital stay but an increase in the number of days given an individual had at least one stay.

5.3.2 Non-disabled Adults

County level: Similar to the results for non-disabled children, there were no observed impacts on the number of surgical or medical related admissions in Ohio. In the other sites, more often than not there was no impact either on having any hospital stays during the year or the number of hospital stays. In both Santa Barbara and San Mateo, there was an increase in the number of surgical and medical admissions, but no impact on the number of days for surgery and medical admissions. Also in both California counties, there was a decrease in the number of hospital days for delivery related admissions.

Continuously enrolled: None of the measures indicated that there was an impact of managed care on hospital use.

53.3 SSI Children

County level: There were inconsistent results in the California counties where hospital use among SSI eligible children was studied.

5.3.4 SSI Adults

County level: In the California counties there was no change in the number of delivery related stays. However, there was an increase in non-delivery-related stays in one county and a decrease in the other county. The analysis did not reveal any impacts on hospital use in any of the New Mexico counties studied.

Continuously enrolled: In the New Mexico counties there was an increase in the probability of any non-delivery stays and no impact on the number of non-delivery related hospital days.

5.4   Controlling Program Expenditures

Expenditure control is the raison d'etre of many Medicaid managed care programs. Because of data availability and data quality issues, different expenditure measures were used in each of the study sites. In the California counties, we calculated what happened to overall Medicaid expenditures, while in the New Mexico and the Florida comparison and 1915(b) counties the measures were whether any Medicaid payments were made during the year and total Medicaid payments per user incurred (fee-for-service plus capitation) whether the beneficiary was in fee-for-service or managed care all, part, or none of the year. Because of benefit package differences and reporting peculiarities, expenditures did not cover the same items in California, Florida and New Mexico. In Ohio, where we did not have expense data in the pre-period, we measured both how total Medicaid payments compared between Montgomery County (the 1915(b) site) and Summit County (the control site) during the post year, and counterfactual costs.

We also estimated counter-factual costs for Florida and New Mexico. Counter-factual costs are defined as what spending in the 1915(b) site would have been had it remained total in the fee-for-service system and not gone to managed care. No matter the measure, however, we hypothesize that if managed care works as expected then we should see a decrease in all measures.

5.4.1 Non-Disabled Children

County level: Like some of the other variables, no consistent results emerged for **AFDC** children. Thus we cannot say with any degree of certainty that resources were saved by instituting managed care. **In** both California 1915(b) counties, expenditures were lower than in Ventura, the comparison county. However, only in the Florida counties did total Medicaid payments go down per user. The reverse was found in New Mexico, namely that total Medicaid payments went up. **In** Ohio, the analysis indicated that there were no differences in expenditures, *ceteris paribus,* between Montgomery and Summit counties but that counterfactual costs were higher. Counterfactual costs were lower for non-disabled children in the 1915(b) sites in Florida and New Mexico, however.

Continuously enrolled: The results were different across sites than for the county level analysis. Once again, total Medicaid payments per user increased in New Mexico but for continuous enrollees there was no change observed in the Florida counties.

5.4.2 Non-Disabled Adults

County level: The results were identical as for non-disabled children.

Continuously enrolled: Total Medicaid payments went in opposite directions in Florida and New Mexico. As a result of 1915(b), total Medicaid payments among users went down in Florida but up in New Mexico. Counter-factual costs were lower in New Mexico and Florida 1915(b) counties indicating that expenses would have increased had these sites stayed in fee-for-service. However, counter-factual costs in Montgomery County were higher than in Summit County.

5.43 SSI Children

County level: In both California counties, expenditures decreased for children eligible for SSI who were enrolled in managed care.

5.4.4 SSI Adults

County level: In both Santa Barbara and San Mateo counties, program expenditures decreased over time. In New Mexico, there was no change in total Medicaid payments among users.

Continuously enrolled: The New Mexico data indicated a decrease in total Medicaid payments among users.

6. Discussion and Policy Implications

Many state Medicaid programs now are using 1915(b) waivers in order to introduce managed care into many areas across their states. Policymakers uniformly see Medicaid managed care as a way of improving access and continuity of care while at the same time changing utilization patterns in such a way that expenditures decrease or at least are held in check. Prior to the introduction of Medicaid managed care and 1915(b) waivers programs in particular, state officials expressed great concern about a variety of access and continuity issues including the declining availability of specialists, often obstetrician-gynecologists, and the unnecessary use of the ER due to the unavailability of primary care physicians. Though this study only analyzed administrative data and could not therefore measure impacts on access directly, administrative data are excellent for studies of utilization and expenditure patterns. Careful interpretation is required for using administrative data to draw conclusions about access to care after the introduction of 1915(b) waivers.

This study was the first comprehensive study of 1915(b) waivers. Many previous studies used data from only one implementation site and studied only one of the areas of interest (e.g. access, quality, utilization, expenditures). This is a study of multiple counties in four different states that differ in their demographic make-up, the types of counties in which 1915(b) programs are implemented (urban, suburban and rural), the structure of managed care (HMO, IPA, PCCM) and the length of experience with managed care. To our knowledge, the time series analysis conducted on the experience in Santa Barbara and San Mateo counties in California is the first longitudinal analysis ever conducted. The previous literature also is characterized by an abundance of information on AFDC beneficiaries in managed care; this study is extended to SSI beneficiaries too. While caution must be exercised in trying to generalize the findings from the four states that were part of this study to other situations and eligibility groups, these results add to the list of studies that cast some doubt on the overall effectiveness of 1915(b) waivers in bringing about the desired changes in access, use or cost (Hurley, Freund and Paul, 1993; Leibowitz, Buchanan and Mann, 1993, Sisk et al.,1996); of course, other studies come to different conclusions (Goldman, Leibowitz and Buchanan, 1998). State and federal policymakers, as well as Medicaid program and health plan administrators who are now anticipating a world in which managed care is the norm and the acquisition of 1915(b) waivers no longer are necessary should scrutinize these results in order to define better the specific steps to consider in monitoring and improving their own 1915(b) programs in order to achieve the simultaneous goals of increased access to care and lower cost.

As a group of study findings, these results, summarized both verbally and graphically immediately above, are encouraging in some aspects but discouraging in others. Simply put, we found limited evidence that in the early 1990s, the 1915(b) Medicaid managed care programs that we studied dramatically changed patterns of utilization and expenditures compared to the FFS program. However, 1915(b) programs certainly worked at least as well as FFS in improving primary care access and preventive care use. Perhaps the most encouraging signs come in the area access to care where there is fairly strong evidence of increased access to care for continuously eligible non-disabled children and adults but not for other participation groups or the SSI population. In terms of preventive care use, there was little evidence of improvement. Continuously eligible non-disabled children experienced most of the gains; these were not shared

by all participants so no positive impacts were seen in the county level analyses. Similarly, continuously enrolled non-disabled and SSI women experienced increases in the pap smear rates in several instances, but this improvement was not seen overall in the county-level analyses.

Previous studies have almost uniformly shown that there is a decrease in ER use (Hurley, Freund, and Paul, 1993). Similar results are obtained in this 1915(b) study whereby if there is any impact at all on ER use, it is in the direction of a reduction. However, the county-level results of this study does not confirm in a convincing way that ER reductions are followed by an increase in the use of ambulatory care, which might have suggested increases in access to primary care. Similarly, whatever the measure there is no strong indication that expenditures have been reduced as a result of 1915(b) waivers, perhaps because hospital use was almost never found to be reduced in any of the analyses.

Different results were presented both at the county level and for continuous enrollees to see whether lengthier enrollment offers the opportunity for better health education, more appropriate utilization and the adoption of healthier life styles. Except for access to care and some measures of prevention, the results for the continuously eligible population, whether child, adult, non-disabled or SSI, are the same as in the county level analyses. Also, while the accumulated experience in the California counties does not suggest dramatically different conclusions from the three other states, there are some positive changes that are reinforced over time. There is no uniform increase in either Santa Barbara or San Mateo in the use of preventive care; but for the few measures where increases are found, such as increases in well child visits in Santa Barbara, the results bring the counties much closer to the privately insured rate, having started at a base already higher than the counties in Ohio, Florida and New Mexico. Also, the results in California, unlike all the other study sites, do show decreases in expenditures in all cases, with those becoming increasingly negative over time for both SSI adults and children.

An aggregate study such as has been attempted here is not designed to pinpoint the specific reasons that managed care has not brought about expenditure reduction coupled with improvements in patterns of use for ambulatory and hospital care, the use of preventive care, or access to care. Rather, "to get to the bottom" of understanding 1915(b) managed care programs and how to improve them will require more detailed, less aggregated studies in the future. Research and program administrators alike should focus on processes of care in particular managed care environments to identify the road blocks that lead to lessor improvements in access quality, use and cost than is desired. For example, we need to focus on why a particular immunization was not delivered, not the number of times an immunization was delivered. By focusing on very sick enrollees, we need to find out precisely why hospital use remains unchanged and how to bring about those changes. The barriers to success may well be different in health plans organized differently, where there are carve-outs for EPSDT versus no carve-outs, or where there are different types of relationships between state officials and health plan administrators. Managed care in Medicaid can work. This study has suggested several instances where it has. However, for Medicaid beneficiaries to realize the potential improvements that managed care can bring will likely require a reorientation on the part of Medicaid officials at the state and federal levels and health plan administrators.

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APPENDIX A

**AMBULATORY CARE SENSITIVE CONDITION
DIAGNOSIS CODES**

AMBULATORY SENSITIVE CONDITION AND CONTROL CONDITICN DIAGNOSIS CODES

Condition	ICD-9 Code[1]	Additional Restrictions
Ambulatory Sensitive Conditions		
1. Congenital syphilis	090	
2. Bacterial meningitis	032	
3. Polio	045	
4. Measles	055	
5. Mumps	072	
6. Whooping cough	033	
7. Tetanus	037	
8. Hemophilus meningitis	320.0	Age 1-5 only
9. Hepatitis B	070.2, 070.3	
10. Chicken Pox	052	
11. Rheumatic fever	390, 391	
12. Chronic obstructive pulmonary disease	49 1, 492, 494, 496	**466.0** only with a secondary dx of 49 1, **492, 494,** or 495
13. Bacterial pneumonia	481, 482.2, 482.3, 482.9, 483, 485,486	Exclude cases with secondary diagnoses of 282.6 (sickle cell) among patients under 2 months of age and secondary diagnoses of 493 (asthma)
14. Asthma	493	Include cases with 493 as a primary dx or as a secondary dx for primary dx of **466, 480-483, 485-487, 518.8, 786.0**
15. Congestive heart failure	428, 402.01, 402.11, 402.91	Exclude 402.0 (hypertension) and exclude all cases with the following surgical procedures: **36.01, 36.02, 36.05, 36.1, 37.5,** 37.7
16. Hypertension	401.0, 402.0, 403.0, 404.0, 405.0, 437.2	Exclude cases with the following surgical procedures: **36.01, 36.02, 36.05, 36.1, 37.5,** 37.7

Condition	ICD-9 Code[1]	Additional Restrictions
17. Cellulitis	681,682	Exclude cases with the following procedures: 01-86.99, except 86.0 where it is the only surgical procedure listed
18. Diabetes A	250.1, 250.2, 250.3	
19. Hypoglycemia	251.2, 251.0 with E932.3	
20. Kidney/urinary tract infection	590, 599.0, 599.9	include cases with these codes as primary dx or secondary dx with 038 as primary
21. Dehydration, primary dx	276	
22. Dehydration, secondary dx	276	
23. Dental conditions	521, 522, 523	
24. Iron-deficiency anemia	280.1, 280.9	
25. Failure to thrive	783.4	
26. Pelvic inflammatory disease	614, 615, 616.0	
27. Perforated/bleeding ulcer	531, 532, 533	
28. Late dx breast cancer	174-174.9 with 198-198.9	
29. Late dx cervical cancer	180-180.9 with 198-198.9	
30. Decubitus ulcer	707	
31. Gangrene	785.4	
32. Drug toxicity/side effects	995.2, E930-E949	
33. Metabolic disorders	270	Age < 8 weeks
34. Jaundice	774.0-774.7, 773.0-773.2, 773.4-773.5	Age > 2 days and < 6 weeks
35. Feeding difficulties	783.2-783.4	Age < 8 weeks

[1] Note that if only a threedigit code is provided, then all four- and five-digit codes beginning with the three digits in the three-digit code are included as well.

APPENDIX B

**SPECIFICATIONS FOR PREVENTIVE CARE
MEASURES FOR CHILDREN**

SPECIFICATIONS FOR PREVENTIVE CARE MEASURES FOR CHILDREN

For the 1915(b) States, we will be computing the following preventive care measures for children:

- probability of having all well-child visits recommended for children aged 2 months to 2 years;
- probability of having any well-child visits – children 2 months to 2 years and 3 to 5 years; and
- probability of having all immunizations recommended for children;
    - diphtheria-tetanus-pertussis (DTP) for 2-30 months of age at end of year,
    - oral polio vaccine (OPV) for 2-30 months of age at end of year,
    - measles, mumps and rubella (MMR) for 15-27 months of age at end of year,
    - DTP, OPV and MMR combined for 2-30 months of age at end of year.

The specification for the computation of these measures are provided below.

Well-Child Visits

To assess the extent to which Medicaid-enrolled children received any well-child visits and the extent to which they were compliant with the American Academy of Pediatrics (AAP) recommended periodicity schedule for well-child visits, we will compute two measures – a participation rate and a visit rate. To do so, we will assign two weights to each child in the database -- a participation weight and a visit weight. The participation weight $(\overline{P})$ reflects the child's expected probability of having a well-child visit during the year while the visit weight $(\overline{S})$ reflects the child's expected number of visits during the analysis year. We will adjust the values assigned for both weights for the child's age and enrollment duration.

In deriving and adjusting the weights, we first determine the recommended number of screening visits for a child enrolled for the full 12 months of the analysis year based on the AAP periodicity schedule and the age of the child at the end of the year. (See Table 1.) We then adjust for duration of enrollment by multiplying the number of recommended visits by the fraction of the year that the child was enrolled in Medicaid, or if the child was less than 12 months of age, the fraction of the child's life during which s/he was enrolled. This methodology assumes that a child was equally likely to have a visit during a month in which s/he was enrolled as during a month in which s/he was not enrolled. Thus, the expected number of visits, $\overline{S}_{ij}$, for the ith child in the jth age group for age groups under 12 months is:

$$\bar{S}_{ij} = \frac{Months\ Enrolled_{ij}}{Months\ of\ Life_j} \times No.\ of\ Recommended\ Visits_j$$

and for the ith child in the jth age group for age groups 12 months or greater is:

$$\bar{S}_{ij} \;=\; \frac{\textit{Months } \textbf{Enrolled}_{ij}}{12} \; x \; \textit{No. of Recommended } \textbf{Visits}_j$$

The child's visit weight is simply the expected number of visits, $\overline{S}_{ij}$. The participation weight, P_{ij}, is equal to one if the expected number of visits for the child is greater than or equal to one. Otherwise, the child's participation weight is equal to $\overline{S}_{ij}$, that is:

$$\textit{If } \; \bar{S}_{ij} \geq 1 \quad \textbf{then} \quad \bar{P}_{ij} = 1;$$

$$\textit{else} \qquad \bar{P}_{ij} = \bar{S}_{ij}.$$

Note that both the participation and visit weights can be fractions.

We will use these weights to compute participation and visit rates for children in different age groups. Participation rates give the percentages of children with at least one visit among those recommended (expected) to have at least one visit. The numerator for the participation rate is the count of individuals with any well-child visits during the year (i.e., $P_{ij} = 1$ for children with at least one visit and zero for children with no visits), where well-child visits are defined by procedure and diagnosis codes, as shown in the attached list, and/or other state-specific procedure codes for preventive care visits. The denominator is the total expected number of participants, computed by summing the participation weights over the child population being tabulated.

$$\textit{Participation Rate} \;=\; \frac{\textit{Actual No. of Participants}}{\textit{Expected No. of Participants}} \times 100 \;=\; \frac{\sum_j \sum_i P_{ij}}{\displaystyle\mathop{c}_{j}\;\mathop{c}_{i}\,\bar{P}_{ij}} \times 100$$

Visit rates give the percentages of total recommended (expected) visits children in different subgroups actually had. The numerator of the visit rate is the smaller of the total number of well-child visits children had during the year (i.e., S_{ij}) or the expected number of visits rounded up to the nearest integer (e.g., CEIL $[\overline{S}_{ii}]$).[1] The denominator is the total expected number of visits, computed by summing children's visit weights.

$$\textit{Visit Rate} \;=\; \frac{\textit{Actual No. of Visits}}{\textit{Expected No. of Visits}} \times 100 \;=\; \frac{\sum_j \sum_i S_{ij}}{\displaystyle\mathop{c}_{j}\;\mathop{c}_{i}\,\bar{S}_{ij}} \times 100$$

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[1] Medicaid law allows interperiodic screening visits for children under the EPSDT program. Therefore, children may have more than the recommended number of visits. So that we do not count these extra visits in our index, we have capped the visits counted for each child at the expected number of visits rounded up to the next highest integer.

Immunizations

To assess Medicaid children's compliance with the AAP periodicity schedule for immunizations, we will assign a set of weights to each child in the database. There will be a weight for each of three types of vaccinations – diphtheria-tetanus-pertussis (DTP), oral polio vaccine (OPV), and measles, mumps and rubella (MMR). These three vaccinations types for seven common childhood diseases represent the basic immunization series for which the Public Health Service is seeking a 90 percent compliance rate among two-year-olds by the year 2000.

The weights reflect the child's expected number of Medicaid-covered immunizations of each type during the analysis year. To compute the weights, we will determine how many vaccinations of each type the child should have had during the year given his/her age in months at the end of the year. (See Table 1.) Then, to account for the fact that many children were enrolled for less than the full year, we will multiply these numbers by the percentage of months in the year during which the child was enrolled. This adjustment assumes that the child is equally likely to receive immunizations during periods of Medicaid enrollment and periods of disenrollment.

We then will sum the weights for each type to obtain the total expected number of immunizations of that type received by the child population under study. These figures are the denominators for the immunization compliance rates. The numerators are the sum of all immunizations of that type received by the population as reflected in the number of billed immunizations in the claims data.

$$
\text{Compliance Rate for } k = \frac{\text{Actual Number of kth Immunization}}{\text{Expected Number of kth Immunization}} \frac{\sum_j \sum_i I_{ijk}}{\sum_j \sum_i \bar{I}_{ijk}} \times 100
$$

$$
\bar{I}_{ijk} = \frac{\text{Months Enrolled}_{ij}}{M_{ij}} \times \text{Number of kth Immunization Recommended for } i
$$

where M_{ij} is 12 if the child is 12 months of age or older and equals the number of months the child has been alive if the child is under 12 months of age.

Because a number of children received immunizations later than recommended and, therefore, are not truly in compliance, we will recompute the compliance rate counting only those immunizations that fell within the recommended age range – i.e., if a child had three **DTPs** but only was supposed to have had only two, we will count only two in the "age-appropriate" compliance rates. We compute both sets of rates ratter than just the age-appropriate rates because the extent to which the Medicaid program allows children to catch up on missed

immunizations is an important measure of the success of the program in reaching children who otherwise would not receive these immunizations.

Finally, an overall compliance rate for the basic childhood immunization series will be computed by summing both the numerator and the denominator over the types of immunizations using only age-appropriate immunizations for each immunization type in the numerator.:

$$Basic\ Immunizations\ Compliance\ Rate = \frac{\sum_{k}\sum_{j}\sum_{i} I_{ijk}}{\sum_{k}\sum_{j}\sum_{i} \bar{I}_{ijk}} \times \text{loo}$$

TABLE 1

Age at End of Year	Number of Recommended Well-Child Visits	Number of Recommended Immunizations			
		DTP	OPV	MMR	Basic Series
0 months	0	n.a.	n.a.	n.a.	n.a.
1 month	1	n.a.	n.a.	n.a.	n.a.
2-3 months	2	1	1	0	2
4-5 months	3	2	2	0	4
6-8 months	4	3	2	0	5
9-11 months	5	3	2	0	5
12 months	6	3	2	0	5
13 months	5	3	2	0	5
14 months	4	2	1	0	3
15 months	5	2	1	1	4
16-17 months	4	1	0	1	2
18-20 months	4	1	1	1	3
2 1-26 months	3	1	1	1	3
27-29 months	2	1	1	0	2
30 months	1	1	1	0	2
31 mos. - 5 yc.	1	n.a.	n.a.	n.a.	n.a.

in the previous 12 months.

PROCEDURE CODES FOR PREVENTIVE CARE **VISITS,** SELECTED **CHILDHOOD** IMMUNIZATIONS, AND **PAP SMEARS**

A.   EPSDT and Other Preventive Care Visits

1.   CPT-4 codes that do not require accompanying diagnosis codes

   90750-90755, 90757, 90760-90764, 99381-99384, 99391-99394, 99432, 99438

2.   CPT-4 codes requiring accompanying diagnosis code for preventive care*

   90000,900 10,900 15,900 **17, 90020, 90030, 90040, 90050, 90060, 90070, 90080**
   99201-99205, 99211-99215

3.   National HCPCS codes requiring accompanying diagnosis code for preventive care*

   In 1989, the following codes were used: **M0005-M0009.**
   In 1992, these codes were used as physical therapy office visits and should not be
   used as preventive care visit codes.

4.   UB82 revenue **ccodes** requiring accompanying diagnosis code for preventive care*

   510, 519-521, 523, 529, 982, 983

5.   **UB92** revenue codes requiring accompanying diagnosis code for preventive care*

   515

6.   State-specific   codes

   Ohio: **Y0001 , 0020, Y0040** (These codes require an accompanying
                    diagnosis code for preventive care.*)

   California: **00962, 00974, Z1004, Z1012, Z1028** (These codes do not require an
                    accompany diagnosis code.)

                    9000 **1, 9002** 1-90026,9008 1-90084

   New Mexico: **0805Y, 0017W, 0018W, 0019W, 0020W, 0037W, 0039W, 0040W**

                    0026W, 0801Y (These two codes require an accompanying diagnosis
                    code for preventive care.*)

   Florida: W988 1

*ICD-9-CM diagnosis codes for preventive care: V03-V03.9, V04-V04.8, V05-V05.9, V06-V06.9, V18-V18.8, V19-V19.8, V20-V20.2, V21-V21.9, V29-V29.9, V70.0, V70.3, V70.5-V70.9, V72.0-V72.1, V72.3, V72.6, V72.8-V72.9, V73-V73.9, V74-V74.9, V75-V75.9, V76-V76.9, V77-V77.9, V78-V78.9, V79-V79.9, V80-V80.3, V81-V8 1.6, V82-V82.9.

B. DTP Immunization

1. **CPT-4** codes: 9070 1, 90702

2. State-specific codes

California: 12605, 12609, 12701-12715, 90720, X6100, X6102, X6348, X6960, X6958, X6956, X6954, X6952, X6950, **X5304-X53** 10, X53 12-X53 16, X5332 (multiple codes in this series given on a single day should count as a single immunization)

Florida: W9877

C. OPV Immunization

1. CPT-4 code: 907 12

2. **State-specific** codes

Ohio: J6005

California: 12840- 12842, X6774

D. MMR Immunization

1. CFT-4 codes: 90704-90709 (multiple codes in this series given on a single day should count as a single immunization)

2. State-specific codes

Ohio: J6030, J6035, J6040 (multiple codes in this series given on a single day should count as a single immunization)

California: 12603, 12604, 12817-12822, 90721-90723, X5300, X5322, X5318, X5324, X5302, X5320, X6346, X6344 (multiple codes in this series given on a single day should count as one immunization)

E. Pap Smear

1. CPT-4 code: 88150, 88151

2. National HCPCS code: Q0091, P3000-P3001

3. UB82 revenue code: 923

4. State-specific

    Ohio: 8900

    California: 88150, 88155

    Florida: Q0060, Q0061

APPENDIX C

**ESTIMATED COEFFICIENT FOR THE
CALIFORNIA COUNTY ORGANIZED HEALTH SYSTEMS**

Table Cl. Random Effects Panel Data Results for AFDC Adults

	Continuous						Probit	
	Ambula-tory Visits	ER Visits	Lab & Radiology Visits	Hospital Admis-sions	Medica-tions	Expend-itures	Any Ambula-tory Care	Any ACS Hospital-ization
SB	-0.2950	-0.0331	-0.2246	-0.0002	-0.0692	-0.6629	-0.4053	0.2295
	(0.0122)	(0.0009)	(0.0037)	(0.0001)	(0.0103)	(0.0398)	(0.0122)	(0.0556)
SB*D2	0.0378	0.0059	0.0537	-0.0011	0.0322	0.1171	0.0105	-0.0347
	(0.0137)	(0.0012)	(0.0042)	(0.0001)	(0.0142)	(0.0366)	(0.0129)	(0.0951)
SB*D3	0.0437	0.0095	0.0676	-0.0009	0.0053	0.2248	0.0200	0.0041
	(0.0170)	(0.0015)	(0.0053)	(0.0001)	(0.0175)	(0.0459)	(0.0152)	(0.1202)
SB*D4	-0.0076	0.0075	0.0729	0.0000	0.0151	0.2978	-0.0093	0.0470
	(0.0201)	(0.0017)	(0.0062)	(0.0001)	(0.0205)	(0.0542)	(0.0176)	(0.1257)
SB*D5	-0.0200	0.0120	0.0863	0.0008	-0.0058	0.3393	-0.0310	-0.0438
	(0.0227)	(0.0019)	(0.0070)	(0.0001)	(0.0229)	(0.0619)	(0.0195)	(0.1548)
SB*D6	-0.0186	0.0181	0.1058	0.0047	0.0138	0.4457	-0.0383	-0.2017
	(0.0247)	(0.0020)	(0.0076)	(0.0001)	(0.0241)	(0.0686)	(0.0212)	(0.1602)
SB*D7	0.0291	0.0287	0.1568	0.0037	-0.0346	0.4982	-0.0221	-0.2294
	(0.0279)	(0.0023)	(0.0086)	(0.0002)	(0.0273)	(0.0770)	(0.0221)	(0.2106)
SB*D8	0.1807	0.0366	0.1890	0.0051	0.1521	0.9778	0.2824	0.2118
	(0.0309)	(0.0025)	(0.0095)	(0.0002)	(0.0305)	(0.0850)	(0.0253)	(0.2022)
SB*D9	0.1754	0.0580	0.2383	0.0068	0.1889	1.1117	0.3087	0.0816
	(0.0342)	(0.0028)	(0.0106)	(0.0002)	(0.0341)	(0.0937)	(0.0267)	(0.2007)
SB*D10	0.0200	0.0507	0.2495	0.0080	0.1542	1.0046	0.0929	0.2248
	(0.0393)	(0.0033)	(0.0122)	(0.0002)	(0.0397)	(0.1070)	(0.0323)	(0.1991)
SB*D11	-0.0888	0.0430	0.2674	0.0008	0.1600	0.9819	-0.0666	-0.1793
	(0.0495)	(0.0042)	(0.0153)	(0.0003)	(0.0508)	(0.1334)	(0.0392)	(0.3808)
SM	-0.1537	-0.0006	-0.0722	0.0005	-0.0224	-0.3926	-0.1794	0.2613
	(0.0127)	(0.0009)	(0.0038)	(0.0001)	(0.0106)	(0.0420)	(0.0122)	(0.0537)
SM*D2	0.0297	-0.0010	0.0113	-0.0003	-0.0220	0.0146	0.0232	0.0904
	(0.0135)	(0.0012)	(0.0042)	(0.0001)	(0.0140)	(0.0362)	(0.0128)	(0.0901)
SM*D3	0.0065	-0.0067	-0.0038	-0.0013	-0.1278	-0.1046	-0.0085	-0.0055
	(0.0171)	(0.0015)	(0.0053)	(0.0001)	(0.0177)	(0.0459)	(0.0146)	(0.1204)
SM*D4	0.0836	-0.0091	0.0145	-0.0018	-0.0381	0.0437	0.0840	0.0816
	(0.0206)	(0.0018)	(0.0064)	(0.0001)	(0.0214)	(0.0553)	(0.0174)	(0.1320)
SM*D5	0.0582	-0.0006	0.0141	-0.0013	-0.1218	0.0153	0.0528	-0.0566
	(0.0256)	(0.0022)	(0.0079)	(0.0001)	(0.0266)	(0.0686)	(0.0208)	(0.1710)
SM*D6	-0.1057	-0.0197	-0.0854	0.0007	-0.2329	-0.1168	-0.1961	0.1037
	(0.0787)	(0.0070)	(0.0245)	(0.0004)	(0.0836)	(0.2083)	(0.1050)	(0.5156)
Black	-0.0639	-0.0077	-0.0134	-0.0030	-0.0017	-0.1420	-0.0815	0.0041
	(0.0188)	(0.0012)	(0.0055)	(0.0001)	(0.0144)	(0.0642)	(0.0149)	(0.0593)
Other	0.0298	-0.0246	0.0269	-0.0030	-0.0912	0.0046	0.0135	-0.1253
	(0.0107)	(0.0007)	(0.0032)	(0.0001)	(0.0083)	(0.0365)	(0.0087)	(0.0388)
Unknown	-0.0296	-0.0216	0.0122	-0.0002	-0.0692	0.0135	-0.1184	-0.1322
	(0.0150)	(0.0010)	(0.0045)	(0.0001)	(0.0126)	(0.0486)	(0.0150)	(0.0723)
Age	0.0030	-0.0004	-0.0003	0.0004	0.0142	0.0043	0.1159	0.5698
	(0.0005)	(0.0000)	(0.0002)	(0.0000)	(0.0004)	(0.0018)	(0.0277)	(0.1171)
Female	0.3158	0.0169	0.1743	-0.0055	0.1342	0.7560	0.6708	0.1015
	(0.0114)	(0.0008)	(0.0034)	(0.0001)	(0.0091)	(0.0380)	(0.0119)	(0.0483)

patients = 21,802, obs = 386,410, based on 25% random subsample
Note: standard errors in parentheses.

Table Cl. Random Effects Panel Data Results for AFDC Adults (continued)

	Continuous						Probit	
	Ambula-tory Visits	ER Visits	Lab& Radiology Visits	Hospital Admis-sions	Medica-tions	Expend-itures	Any Ambula-tory Care	Any ACS Hospital-ization
D2	-0.0776	-0.0052	-0.0542	-0.0006	0.0927	-0.1303	-0.0475	-0.0926
	(0.0082	(0.0007)	(0.0025)	(0.0000)	(0.0084)	(0.0223)	(0.0069)	(0.0660)
D3	-0.0596	-0.0005	-0.052 1	-0.0005	0.1879	-0.1039	-0.0238	-0.1483
	(0.0106)	(0.0009)	(0.0033)	(0.0001)	(0.0106)	(0.0292	(0.0087)	(0.0871)
D4	-0.0383	0.0058	-0.0576	-0.0007	0.2344	-0.1099	-0.0023	- 0 . 1 1 0 3
	(0.0126)	(0.0010)	(0.0039)	(0.0001)	(0.0125)	(0.0354)	(0.0101)	(0.0970)
D5	-0.008 1	0.002 1	-0.0685	-0.0008	0.2946	-0.0566	0.0339	-0.0892
	(0.0142)	(0.0011)	(0.0044)	(0.0001)	(0.0138)	(0.0407)	(0.0112)	(0.1047)
D6	-0.0114	-0.0054	-0.0728	-0.0027	0.2850	-0.1207	0.0305	-0.0162
	(0.0154)	(0.0012)	(0.0047)	(0.0001)	(0.0143)	(0.0451)	(0.0114)	(0.0956)
D7	-0.0346	-0.0 125	-0.1023	-0.0038	0.345 1	-0.1726	0.0084	-0.1297
	(0.0179)	(0.0014)	(0.0054)	(0.0001)	(0.0166)	(0.0525)	(0.0134)	(0.1115)
D8	-0.1063	-0.0113	-0.1338	-0.0045	0.3292	-0.3256	-0.0926	-0.2587
	(0.0203)	(0.0016)	(0.0062)	(0.0001)	(0.0188)	(0.0594)	(0.0152)	(0.1477)
D9	-0.1087	-0.0129	-0.1571	-0.0039	0.4158	-0.3297	-0.1182	-0.0649
	(0.0227)	(0.0018)	(0.0069)	(0.0001)	(0.0213)	(0.0665)	(0.0158)	(0.1455)
D10	0.049 1	-0.0032	-0.1312	-0.0042	0.4766	-0.2256	0.0366	0.0322
	(0.0259)	(0.0020)	(0.0079)	(0.0002)	(0.0246)	(0.0751)	(0.0195)	(0.1343)
D11	0.1017	-0.0013	-0.1361	-0.0046	0.5861	-0.1253	0.1405	-0.1621
	(0.0320)	(0.0026)	(0.0098)	(0.0002)	(0.03 13)	(0.0908)	(0.0247)	(0.1967)
1988	-0.0453	-0.0133	0.0008	-0.0007	-0.0747	-0.1500	-0.1213	-0.046 1
	(0.0081)	(0.0007)	(0.0025)	(0.0000)	(0.0084)	(0.0218)	(0.0076)	(0.0631)
1989	0.054 1	-0.005 1	0.0239	0.0008	-0.0162	0.0645	0.0574	0.0029
	(0.0087)	(0.0007)	(0.0027)	(0.0000)	(0.0089)	(0.0239)	(0.0076)	(0.0645)
1990	-0.0009	-0.0110	0.0195	0.0011	-0.0084	0.0323	-0.0088	0.0765
	(0.0092)	(0.0008)	(0.0028)	(0.0001)	(0.0091)	(0.0256)	(0.0075)	(0.0613)
1991	0.0039	-0.0095	0.0595	0.0013	0.0178	0.0006	-0.0388	0.0056
	(0.0095)	(0.0008)	(0.0029)	(0.0001)	(0.0092)	(0.0273)	(0.0079)	(0.0633)
1992	0.0306	-0.0096	0.0631	0.002 1	0.0794	0.1237	-0.0085	0.0176
	(0.0100)	(0.0008)	(0.0031)	(0.0001)	(0.0094)	(0.0297)	(0.0081)	(0.0624)
Constant	0.2923	0.095 1	0.1388	0.0022	-0.1822	0.8182	-1.1748	-3.7858
	(0.0228)	(0.0015)	(0.0068)	(0.0002)	(0.0187)	(0.0755)	(0.0209)	(0.1109)

patients = 21,802. obs = 386,410, based on 25% random subsample

Note: standard errors in parentheses.

Table C2. Random Effects Panel Data Results for AFDC Children

	Continuous						Probit	
	Ambula-tory Visits	ER Visits	Lab& Radiology Visits	Hospital Admis-sions	Medica-tions	Expend-itures	Any Ambula-tory Care	Any ACS Hospital-ization
SB	-0.1385 (0.0055)	-0.0292 (0.0005)	-0.0725 (0.0011)	-0.0026 (0.00004)	-0.1219 (0.0059)	-0.3743 (0.0228)	-0.2663 (0.0141)	-0.1631 (0.0894)
SB*D2	0.038 1 (0.0055)	0.0062 (0.0007)	-0.0085 (0.0011)	0.0020 (0.00003)	0.0132 (0.0068)	0.0763 (0.0210)	0.0804 (0.0153)	0.0776 (0.1332)
SB*D3	0.0599 (0.0066)	0.0109 (0.0008)	0.0053 (0.0013)	0.0009 (0.00004)	0.0458 (0.0082)	0.1496 (0.0253)	0.1187 (0.0168)	-0.0640 (0.1798)
SB*D4	0.0790 (0.0076)	0.0130 (0.0009)	0.0160 (0.0015)	0.0020 (0.00005)	0.0664 (0.0095)	0.2109 (0.0294)	0.1701 (0.0199)	0.0475 (0.1938)
SB*D5	0.1167 (0.0087)	0.0228 (0.0010)	0.0235 (0.0017)	0.0016 (0.00005)	0.0939 (0.0107)	0.3170 (0.0337)	0.2460 (0.0227)	-0.1354 (0.3627)
SB*D6	0.1559 (0.0095)	0.0232 (0.0011)	0.0394 (0.0019)	0.0040 (0.00006)	0.1258 (0.0115)	0.4163 (0.0368)	0.3434 (0.0245)	0.4222 (0.3116)
SB*D7	0.1666 (0.0106)	0.0250 (0.0012)	0.0478 (0.0021)	0.0035 (0.00007)	0.1292 (0.0129)	0.4429 (0.0413)	0.3443 (0.0279)	0.4270 (0.3204)
SB*D8	0.2229 (0.0120)	0.0149 (0.0014)	0.0449 (0.0024)	0.0044 (0.00007)	0.2189 (0.0147)	0.6254 (0.0467)	0.5865 (0.0309)	-0.0504 (0.4276)
SB*D9	0.2180 (0.0136)	0.0265 (0.0016)	0.0704 (0.0027)	0.0039 (0.00008)	0.2225 (0.0167)	0.6677 (0.0528)	0.5948 (0.0328)	0.2862 (0.3717)
SB*D10	0.2015 (0.0160)	0.0311 (0.0019)	0.0974 (0.0032)	0.0052 (0.00010)	0.1757 (0.0197)	0.6727 (0.0617)	0.5025 (0.0426)	0.5832 (0.5012)
SB*D11	0.0777 (0.0207)	0.0131 (0.0025)	0.0412 (0.0041)	0.0082 (0.00012)	0.1194 (0.0259)	0.5810 (0.0800)	0.4526 (0.0531)	0.6547 (0.3680)
SM	-0.0891 (0.0056)	-0.0178 (0.0005)	-0.0345 (0.0011)	-0.0016 (0.00004)	-0.0778 (0.0059)	-0.2856 (0.0232)	-0.1635 (0.0139)	-0.0274 (0.0799)
SM*D2	0.0123 (0.0052)	0.0033 (0.0007)	-0.0136 (0.0010)	0.0018 (0.00003)	-0.0245 (0.0066)	0.0052 (0.0202)	0.0067 (0.0151)	-0.0541 (0.1183)
SM*D3	0.0516 (0.0064)	0.0090 (0.0008)	-0.0035 (0.0013)	0.0028 (0.00004)	0.0166 (0.0080)	0.0922 (0.0245)	0.0679 (0.0161)	0.1112 (0.1478)
SM*D4	0.0594 (0.0075)	0.0120 (0.0009)	-0.005 1 (0.0015)	0.0038 (0.00004)	0.0332 (0.0094)	0.1251 (0.0290)	0.0701 (0.0187)	0.1922 (0.1718)
SM*D5	0.0579 (0.0091)	0.0171 (0.0011)	-0.0080 (0.0018)	0.0042 (0.00005)	-0.0202 (0.0114)	0.1510 (0.0350)	0.0458 (0.0224)	0.0003 (0.3463)
SM"D6	0.0605 (0.0278)	0.0162 (0.0036)	0.0062 (0.0056)	0.0025 (0.00016)	0.1086 (0.0354)	0.1851 (0.1067)	0.0888 (0.0927)	-1.6384 (26555.0)
Black	-0.0407 (0.0077)	-0.01 12 (0.0006)	-0.00 (0.0015)	-0.0005 (0.00006)	0.0004 (0.0077)	0.0286 (0.0327)	-0.1296 (0.0172)	0.0698 (0.1056)
Other	-0.0030 (0.0048)	-0.0134 (0.0004)	0.0021 (0.0009)	0.0007 (0.00004)	0.0480 (0.0049)	0.0081 (0.0204)	0.0026 (0.0105)	0.1577 (0.0693)
Unknown	0.005 1 (0.0075)	-0.0 127 (0.0006)	0.0311 (0.0014)	0.0008 (0.00006)	0.0125 (0.0079)	0.0394 (0.0310)	-0.0971 (0.0187)	0.1959 (0.1124)
Age	-0.0109 (0.0004)	-0.0015 (0.0000)	0.003 1 (0.0001)	-0.0001 (0.00000)	-0.0142 (0.0004)	-0.0260 (0.0016)	-2.6580 (0.0569)	- 1.5299 (0.3338)
Female	0.0095 (0.0041)	-0.0056 (0.0003)	0.0182 (0.0008)	-0.0008 (0.00003)	-0.0068 (0.0041)	0.0317 (0.0172)	0.0480 (0.0093)	0.0128 (0.0535)

patients = 16,716, obs = 376,820, based on 12.5% random subsample

Note: standard errors in parentheses.

Table C2. Random Effects Panel Data Results for AFDC Children (continued)

	Continuous						Probit	
	Ambula-tory Visits	ER Visits	Lab& Radiology Visits	Hospital Admis-sions	Medica-tions	Expend-itures	Any Ambula-tory Care	Any ACS Hospital-ization
D2	-0.0337 (0.0034)	0.0012 (0.0004)	0.0085 (0.0007)	-0.0023 (0.00002)	0.0272 (0.0042)	-0.0872 (0.0130)	-0.0437 (0.0090)	- 0 . 0 6 0 7 (0.0716)
D3	-0.0827 (0.0041)	-0.008 1 (0.0005)	-0.0067 (0.0008)	-0.0032 (0.00003)	-0.009 1 (0.0050)	-0.2008 (0.0161)	-.0 1J49 (0.0100)	-0.1789 (0.0893)
D4	-0.0967 (0.0049)	-0.0 123 (0.0006)	-0.0089 (0.0010)	-0.0033 (0.00003)	-0.0287 (0.0059)	-0.243 1 (0.0191)	-0.1324 (0.0115)	-0.2533 (0.1146)
D5	-0.1127 (0.0056)	-0.0170 (0.0006)	-0.0133 (0.0011)	-0.0043 (0.00004)	-0.0443 (0.0067)	-0.2967 (0.0222)	-0.1522 (0.0136)	-0.4732 (0.1553)
D6	-0.1432 (0.0061)	-0.0163 (0.0006)	-0.0308 (0.0012)	-0.0045 (0.00004)	-0.0646 (0.0070)	-0.3765 (0.0243)	-0.2240 (0.0144)	-0.6259 (0.1947)
D7	-0.1622 (0.0070)	-0.0 175 (0.0007)	-0.0428 (0.0014)	-0.0040 (0.00005)	-0.0764 (0.0081)	-0.4191 (0.0281)	-0.2386 (0.0161)	-0.5115 (0.2110)
D8	-0.1685 (0.0081)	-0.0073 (0.0008)	-0.0370 (0.0016)	-0.0047 (0.00005)	-0.0837 (0.0093)	-0.4782 (0.0322)	-0.3082 (0.0190)	-0.2783 (0.2065)
D9	-0.1445 (0.0093)	-0.0103 (0.0010)	-0.0383 (0.0018)	-0.0046 (0.00006)	-0.0614 (0.0107)	-0.4376 (0.0368)	-0.2436 (0.0201)	-0.2255 (0.2448)
D10	-0.1353 (0.0108)	-0.0057 (0.0012)	-0.0452 (0.0021)	-0.0043 (0.00007)	-0.0163 (0.0127)	-0.3899 (0.0428)	-0.1874 (0.0248)	-0.3704 (0.4250)
D11	-0.0522 (0.0134)	0.0062 (0.0015)	-0.0151 (0.0027)	-0.0050 (0.00009)	0.0214 (0.0161)	-0.3460 (0.0527)	-0.1469 (0.0295)	0.1472 (0.2834)
1988	-0.0299 (0.0033)	-0.0054 (0.0004)	0.0067 (0.0007)	0.0002 (0.00002)	-0.0370 (0.0041)	-0.0759 (0.0128)	-0.1308 (0.0096)	-0.0 175 (0.0943)
1989	0.0544 (0.0035)	-0.0014 (0.0004)	0.0225 (0.0007)	0.0006 (0.00002)	0.002 1 (0.0044)	0.1084 (0.0137)	0.0967 (0.0094)	0.1452 (0.0899)
1990	0.037 1 (0.0037)	-0.0030 (0.0004)	0.0225 (0.0007)	0.0000 (0.00002)	-0.0184 (0.0045)	0.0666 (0.0146)	0.0398 (0.0094)	0.0366 (0.0921)
1991	0.0361 (0.0040)	-0.0016 (0.0004)	0.0362 (0.0008)	0.0000 (0.00003)	-0.0090 (0.0047)	0.0493 (0.0157)	0.0234 (0.0098)	0.0545 (0.0906)
1992	0.0588 (0.0043)	-0.0005 (0.0004)	0.0454 (0.0008)	0.0000 (0.00003)	0.0388 (0.0049)	0.1270 (0.0171)	0.0512 (0.0102)	0.0450 (0.0894)
Constant	0.4169 (0.0061)	0.0788 (0.0005)	0.0362 (0.0012)	0.0063 (0.00005)	0.3403 (0.0065)	1.0502 (0.0252)	-0.6400 (0.0138)	-3.8110 (0.1143)

patients = 16,7 16, obs = 376,820, based on 12.5% random subsample

Note: standard errors in parentheses.

Table C3. Random Effects Panel Data Results for SSI Adults

	Continuous						Probi t	
	Ambula-tory Visits	ER Visits	Lab& Radiol-ogy Visits	Hospital Admis-sions	Medica-tions	Expend-itures	Any Ambula-tory Care	Any ACS Hospital-ization
SB	-0.011 (0.045)	-0.0062 (0.0017)	-0.1387 (0.0091)	0.0023 (0.0004)	-0.1191 (0.1054)	-0.2562 (0.088)	0.0625 (0.0165)	-0.1090 (0.0782)
SB*D2	-0.119 (0.033)	-0.0027 (0.0016)	0.0159 (0.0068)	-0.0055 (0.0003)	-0.1559 (0.073 1)	-0.1425 (0.052)	-0.1827 (0.0193)	-0.0179 (0.1132)
SB*D3	-0.213 (0.038)	-0.0016 (0.0019)	0.0100 (0.0078)	-0.002 1 (0.0003)	-0.05 12 (0.0843)	-0.0608 (0.060)	-0.3222 (0.0181)	0.1515 (0.1510)
SB*D4	-0.24 1 (0.042)	0.008 1 (0.0021)	0.0388 (0.0087)	0.0029 (0.0004)	0.0284 (0.0934)	0.0441 (0.067)	-0.3410 (0.0216)	0.4476 (0.1621)
SB*D5	-0.333 (0.046)	0.0060 (0.0022)	0.0233 (0.0094)	0.0044 (0.0004)	0.1545 (0.1018)	0.1849 (0.073)	-0.42 11 (0.0236)	0.7274 (0.1648)
SB*D6	-0.463 (0.046)	0.0060 (0.0022)	0.0076 (0.0095)	-0.0057 (0.0004)	0.2179 (0.1030)	0.1867 (0.075)	-0.5473 (0.0214)	0.0609 (0.1477)
SB*D7	-0.566 (0.049)	0.0030 (0.0023)	0.0255 (0.0102)	-0.0046 (0.0004)	-0.2387 (0.1105)	-0.3143 (0.080)	-0.8490 (0.0245)	0.5007 (0.1886)
SB*D8	-0.304 (0.052)	0.0144 (0.0025)	0.0577 (0.0107)	-0.004 1 (0.0005)	0.7277 (0.1166)	0.7841 (0.084)	-0.2709 (0.0254)	0.2101 (0.1930)
SB*D9	0.180 (0.055)	0.0422 (0.0026)	0.1711 (0.0113)	-0.0033 (0.0005)	0.7518 (0.1222)	1.3414 (0.088)	0.9919 (0.0255)	0.6847 (0.2394)
SB*DlO	-0.514 (0.057)	0.0042 (0.0027)	0.1233 (0.0118)	-0.0043 (0.0005)	0.6782 (0.1281)	0.7628 (0.092)	-0.5734 (0.0286)	0.3873 (0.2263)
SB*Dll	-0.700 (0.061)	0.0302 (0.0029)	0.1004 (0.0126)	-0.0033 (0.0005)	0.4660 (0.1360)	1.0205 (0.098)	-0.6108 (0.03 11)	0.2044 (0.1964)
SM	0.222 (0.040)	0.0091 (0.0015)	-0.0154 (0.0081)	0.0092 (0.0004)	0.3166 (0.0943)	0.1807 (0.079)	0.2680 (0.0140)	0.05 18 (0.0666)
SM*D2	-0.2 11 (0.027)	-0.0014 (0.0014)	-0.0099 (0.0056)	-0.0073 (0.0002)	-0.5019 (0.0607)	-0.6219 (0.043)	-0.299 1 (0.0159)	0.0222 (0.0944)
SM*D3	-0.256 (0.031)	0.0051 (0.0015)	-0.0091 (0.0065)	-0.0076 (0.0003)	-0.5515 (0.0696)	-0.7504 (0.050)	-0.4218 (0.0153)	0.0867 (0.1207)
SM*D4	-0.142 (0.035)	0.0119 (0.0017)	0.039 1 (0.007 1)	-0.002 1 (0.0003)	-0.5489 (0.0769)	-0.7214 (0.055)	-0.2476 (0.0182)	0.2198 (0.1420)
SM*D5	-0.283 (0.038)	0.0133 (0.0019)	0.0170 (0.0078)	-0.0007 (0.0003)	-0.6358 (0.0845)	-0.7648 (0.060)	-0.3591 (0.0196)	0.3899 (0.1526)
SM*D6	-0.400 (0.080)	0.0149 (0.0040)	-0.0016 (0.0164)	-0.0083 (0.0007)	-0.525 1 (0.1766)	-0.6903 (0.126)	-0.4540 (0.0697)	-2.8662 (18446.0)
Black	-0.076 (0.059)	0.0191 (0.0020)	-0.0110 (0.0119)	-0.0047 (0.0005)	0.0972 (0.1415)	-0.0829 (0.121)	-0.1168 (0.0135)	0.1479 (0.0745)
Other	-0.002 (0.039)	-0.0003 (0.0014)	0.0090 (0.0080)	-0.0011 (0.0004)	-0.1558 (0.0944)	-0.1208 (0.081)	-0.2129 (0.0088)	0.0585 (0.0490)
Unknown	-0.041 (0.047)	0.0124 (0.0017)	-0.0005 (0.0094)	0.0143 (0.0004)	-0.097 1 (0.1108)	-0.0692 (0.093)	-0.1149 (0.0227)	0.3606 (0.0691)
Age	0.003 (0.001)	-0.0001 (0.0000)	0.0025 (0.0002)	0.0006 (0.0000)	0.0224 (0.0027)	0.0190 (0.002)	0.2964 (0.0184)	1.2121 (0.1081)
Female	0.173 (0.032)	0.0085 (0.0011)	0.0684 (0.0064)	-0.0025 (0.0003)	0.3323 (0.0759)	0.2962 (0.065)	0.3097 (0.0075)	0.0027 (0.0417)

patients = 7,440. obs = 237,837, based on 25% random subsample

Note: standard errors in parentheses.

Table C3. Random Effects Panel Data Results for SSI Adults (continued)

	Continuous						Probit	
	Ambula-tory Visits	ER Visits	Lab& Radiol-ogy Visits	Hospital Admis-sions	Medica-tions	Expend-itures	Any Ambula-tory care	Any ACS Hospital-ization
D2	0.115	0.0002	-0.0122	-0.0017	0.4796	0.3658	0.1768	-0.0680
	(0.021)	(0.0010)	(0.0043)	(0.0002)	(0.0467)	(0.034)	(0.0117)	(0.0750)
D3	0.085	-0.0097	-0.03 18	-0.0077	0.5099	0.4122	0.2206	-0.322 1
	(0.025)	(0.0012)	(0.005 1)	(0.0002)	(0.0558)	(0.041)	(0.0117)	(0.0912)
D4	0.076	-0.0145	-0.0606	-0.0102	0.5694	0.4152	0.1638	-0.4246
	(0.028)	(0.0013)	(0.0058)	(0.0003)	(0.0639)	(0.047)	(0.0142)	(0.1180)
D5	0.110	-0.0188	-0.0604	-0.0132	0.6569	0.4262	0.1960	-0.5682
	(0.032)	(0.0014)	(0.0065)	(0.0003)	(0.0721)	(0.054)	(0.0150)	(0.1286)
D6	0.171	-0.0197	-0.0683	-0.0099	0.6176	0.4022	0.1847	-0.2069
	(0.033)	(0.0014)	(0.0068)	(0.0003)	(0.0760)	(0.058)	(0.0138)	(0.0826)
D7	0.197	-0.0194	-0.0903	-0.0128	0.6934	0.4656	0.2137	-0.6082
	(0.038)	(0.0016)	(0.0077)	(0.0003)	(0.0866)	(0.067)	(0.0156)	(0.1261)
D8	0.144	-0.0289	-0.1133	-0.0137	0.5586	0.2701	0.1141	-0.3965
	(0.042)	(0.0018)	(0.0086)	(0.0004)	(0.0966)	(0.075)	(0.0170)	(0.1245)
D9	-0.015	-0.0282	-0.1483	-0.0 134	0.6396	0.0370	-0.5452	-0.6847
	(0.046)	(0.0019)	(0.0094)	(0.0004)	(0.1063)	(0.083)	(0.0182)	(0.1991)
D10	0.24 1	-0.0304	-0.1255	-0.0179	0.6673	0.2449	0.1684	-0.5680
	(0.050)	(0.0021)	(0.0103)	(0.0005)	(0.1163)	(0.091)	(0.0198)	(0.1644)
D11	0.321	-0.0453	-0.1226	-0.0 179	0.7182	0.0966	0.1624	-0.3140
	(0.055)	(0.0023)	(0.0112)	(0.0005)	(0.1267)	(0.099)	(0.0217)	(0.1356)
1988	-0.056	-0.0095	0.0082	0.0009	-0.1663	-0.2659	-0.1300	0.0398
	(0.017)	(0.0008)	(0.0034)	(0.0001)	(0.0369)	(0.027)	(0.0097)	(0.0653)
1989	0.073	-0.0029	0.0365	0.0072	0.079 1	0.1312	0.0920	0.1553
	(0.018)	(0.0009)	(0.0038)	(0.0002)	(0.0415)	(0.03 1)	(0.0089)	(0.0671)
1990	-0.4 17	-0.0330	-0.0729	0.0053	0.0961	-0.3 108	-0.9148	0.0477
	(0.02 1)	(0.0009)	(0.0042)	(0.0002)	(0.0467)	(0.035)	(0.0090)	(0.0670)
1991	0.053	0.0024	0.0877	0.0111	0.1677	0.1368	0.0667	0.2957
	(0.023)	(0.0010)	(0.0047)	(0.0002)	(0.053 1)	(0.041)	(0.0099)	(0.0647)
1992	0.224	0.0115	0.1144	0.0110	0.3523	0.4679	0.1626	0.2945
	(0.026)	(0.0011)	(0.0053)	(0.0002)	(0.0597)	(0.047)	(0.0104)	(0.0667)
Constant	0.417	0.0586	0.0852	-0.0045	-0.2643	0.8763	-1.0792	-4.2482
	(0.057)	(0.002 1)	(0.0116)	(0.0005)	(0.1363)	(0.115)	(0.0164)	(0.1081)

patients = 7,440, obs = 237,837, based on 25% random subsample

Note: standard errors in parentheses.

Table C4. Random Effects Panel Data Results for SSI Children

	Continuous						Probit	
	Ambulatory Visits	ER Visits	Lab& Radiology Visits	Hospital Admissions	Medications	Expenditures	Any Ambulatory Care	Any AC Hospitalization
SB	-0.033 1	0.0003	-0.1284	0.0001	0.0620	0.1391	0.2369	0.1415
	(0.0507)	(0.0017)	(0.0091)	(0.0004)	(0.0833)	(0.1608)	(0.0311)	(0.2326)
SB*D2	-0.0850	-0.0134	-0.0566	0.0011	-0.0028	-0.0935	-0.3306	-0.3622
	(0.0389)	(0.0019)	(0.0074)	(0.0004)	(0.0569)	(0.1002)	(0.0340)	(0.2880)
SB*D3	-0.1474	-0.0137	-0.0898	0.0027	-0.0061	-0.1465	-0.4139	-0.1170
	(0.0438)	(0.0021)	(0.0083)	(0.0004)	(0.0642)	(0.1132)	(0.0347)	(0.2908)
SB*D4	-0.0244	-0.0090	-0.0333	-0.0004	0.3050	0.3498	-0.2455	-0.5678
	(0.0470)	(0.0022)	(0.0089)	(0.0004)	(0.0690)	(0.1218)	(0.0382)	(0.4007)
SB*D5	-0.0651	-0.0093	0.0060	-0.0022	0.3922	0.5063	-0.2058	-0.0543
	(0.0498)	(0.0023)	(0.0094)	(0.0005)	(0.0733)	(0.1295)	(0.0415)	(0.4067)
SB*D6	0.1118	0.0129	0.0538	0.0047	0.4174·	0.8820	-0.021/	0.1129
	(0.0506)	(0.0023)	(0.0096)	(0.0005)	(0.0748)	(0.1325)	(0.0393)	(0.5748)
SB*D7	0.0538	0.0015	0.0861	-0.0032	0.4725	0.6081	-0.2490	-0.5243
	(0.0543)	(0.0024)	(0.0103)	(0.0005)	(0.0802)	(0.1422)	(0.0446)	(0.5027)
SB*D8	0.3692	0.0087	0.0554	0.0028	0.6778	1.3450	0.3350	-0.4079
	(0.0590)	(0.0027)	(0.0111)	(0.0005)	(0.0871)	(0.1543)	(0.0451)	(0.8469)
SB*D9	0.8801	0.0261	0.2276	-0.0001	0.7312	2.1163	1.3385	-2.6572
	(0.0638)	(0.0029)	(0.0121)	(0.0006)	(0.0941)	(0.1667)	(0.0493)	(5700.7)
SB*D10	0.1594	0.0143	0.1904	0.0060	0.6482	1.1100	-0.0704	0.2072
	(0.0686)	(0.0031)	(0.0130)	(0.0006)	(0.1010)	(0.1788)	(0.0620)	(0.8121)
SB*D11	0.2036	0.0289	0.1841	0.0009	0.7040	1.1836	0.0213	-0.0878
	(0.0786)	(0.0036)	(0.0149)	(0.0007)	(0.1156)	(0.2043)	(0.0714)	(52228.0)
SM	-0.0158	0.0047	-0.0218	0.0051	0.1534	0.1193	0.1779	0.3931
	(0.0524)	(0.0016)	(0.0094)	(0.0004)	(0.0868)	(0.1684)	(0.0331)	(0.1859)
SM*D2	-0.2750	0.0087	-0.0612	-0.0046	-0.2369	-0.6657	-0.5387	-0.5540
	(0.0377)	(0.0018)	(0.0072)	(0.0004)	(0.0552)	(0.0974)	(0.0410)	(0.2226)
SM*D3	-0.4983	-0.0023	-0.1629	-0.0147	-0.3909	-0.9919	-0.8493	-0.6885
	(0.0430)	(0.0020)	(0.0082)	(0.0004)	(0.0630)	(0.1111)	(0.0377)	(0.3105)
SM*D4	-0.3831	-0.0053	-0.1446	0.0003	-0.0060	-0.7740	-0.6421	-0.2195
	(0.0472)	(0.0022)	(0.0089)	(0.0004)	(0.0692)	(0.1221)	(0.0463)	(0.2829)
SM*D5	-0.4506	0.0052	-0.1792	-0.0033	0.0973	-0.6779	-0.5496	-0.1419
	(0.0523)	(0.0025)	(0.0099)	(0.0005)	(0.0766)	(0.1352)	(0.0480)	(0.3081)
SM*D6	-0.4235	0.0061	-0.1830	0.0183	-0.2027	-0.5725	-0.6469	-2.9067
	(0.1248)	(0.0060)	(0.0237)	(0.0012)	(0.1822)	(0.3209)	(0.1811)	(10887.0)
Black	-0.1366	-0.0010	0.0050	0.0024	-0.1199	-0.3382	-0.3517	0.2245
	(0.0727)	(0.0020)	(0.0129)	(0.0006)	(0.1229)	(0.2412)	(0.0325)	(0.1889)
Other	-0.1283	-0.0022	-0.0178	0.0002	0.0153	-0.1355	-0.2108	0.0740
	(0.0458)	(0.0012)	(0.0081)	(0.0004)	(0.0776)	(0.1523)	(0.0170)	(0.1423)
Unknown	-0.1773	-0.0013	-0.0321	0.0030	-0.0108	-0.4052	-0.3424	0.2163
	(0.0545)	(0.0016)	(0.0097)	(0.0004)	(0.0906)	(0.1762)	(0.0335)	(0.1816)
Age	-0.0117	-0.0029	0.0004	-0.0013	-0.0173	-0.0268	-1.8420	4.7882
	(0.0037)	(0.0001)	(0.0007)	(0.0000)	(0.0063)	(0.0123)	(0.1045)	(0.8870)
Female	0.0278	-0.0089	-0.0119	-0.0004	0.069 1	0.1066	0.0655	0.0772
	(0.0384)	(0.0011)	(0.0068)	(0.0003)	(0.0647)	(0.1267)	(0.0153)	(0.1258)

patients = 1785, obs = 58,73 1

Note: standard errors in parentheses.

Table C4. Random Effects Panel Data Results for SSI Children (continued)

	Continuous						Probit	
	Ambula-tory Visits	ER Visits	Lab& Radiology Visits	Hospital Admis-sions	Medica-tions	Expend-itures	Any Ambula-tory Care	Any ACS Hospital-ization
D2	0.1820	0.0018	0.0487	0.0021	0.1010	0.4211	0.4268	0.3609
	(0.0256)	(0.0012)	(0.0049)	(0.0002)	(0.0377)	(0.0668)	(0.0225)	0.1568)
D3	0.2961	0.003 1	0.1071	0.0021	0.1810	0.5515	0.5614	0.4125
	(0.0299)	(0.0014)	(0.0056)	(0.0003)	(0.0446)	(0.0797)	(0.0240)	(0.1753)
D4	0.1786	0.0042	0.0814	-0.0007	0.1155	0.3983	0.5000	0.3404
	(0.0334)	(0.0015)	(0.0063)	(0.0003)	(0.0505)	(0.0911)	(0.0261)	0.1850)
D5	0.2030	0.0033	0.0570	0.0010	0.0787	0.365 1	0.4910	0.1754
	(0.0371)	(0.0015)	(0.0069)	(0.0003)	0.0567)	0.1033)	0.0279)	0.2139)
D6	0.1018	-0.0198	0.0159	-0.0027	0.0345	0.1390	0.4384	-0.0374
	(0.0390)	(0.0015)	(0.0072)	(0.0003)	0.0606)	0.1116)	0.0271)	0.2865)
D7	0.1609	-0.0175	0.0197	0.0019	0.0567	0.3211	0.5662	0.1591
	(0.0443)	(0.0017)	(0.0082)	(0.0004)	0.0692)	0.1279)	0.0311,	0.2408)
D8	0.0522	-0.0015	0.0437	-0.0053	-0.05 19	-0.0136	0.3560	0.0392
	(0.0494)	(0.0018)	(0.0091)	(0.0004)	0.0775)	0.1436)	0.0326)	0.2616)
D9	-0.2927	-0.0173	-0.0586	-0.0024	-0.0307	-0.4526	-0.2636	0.2058
	(0.0550)	(0.0020)	(0.0101)	(0.0005)	0.0865)	0.1605)	0.0340)	0.4187)
D10	-0.0279	-0.0164	-0.0739	-0.0058	-0.0148	0.0443	0.4823	-0.2010
	(0.0604)	(0.0022)	(0.0110)	(0.0005)	0.0950)	0.1766)	0.0388)	0.5837)
D11	-0.0099	-0.0162	-0.0722	-0.0069	0.0152	0.0359	0.5530	-2.5859
	(0.0664)	(0.0024)	(0.0122)	(0.0006)	(0.1044)	(0.1939)	(0.0461)	(7197.3)
1988	-0.1727	-0.0100	-0.0143	-0.0023	-0.1461	-0.4726	-0.3033	-0.0354
	(0.0193)	(0.0009)	(0.0036)	(0.0002)	(0.0284)	(0.0504)	(0.0188)	(0.1791)
1989	0.0317	-0.0064	-0.0076	0.0025	0.0826	-0.0055	-0.0463	0.1838
	(0.0213)	(0.0010)	0.0040)	(0.0002)	0.0319)	0.0573)	0.0177)	0.1458)
1990	-0.3538	-0.03 14	-0.1091	-0.0023	0.0826	-0.6164	-0.8839	-0.470 1
	(0.0240)	0.0010)	0.0045)	0.0002)	0.0368)	0.0670)	0.0170)	0.2048)
1991	0.0359	0.0004	0.0537	-0.0003	0.1223	-0.1166	-0.1374	0.0282
	(0.0273)	0.0011)	0.0050)	0.0002)	0.0425)	0.0784)	0.0192)	0.1660)
1992	0.1013	0.0007	0.0970	-0.0011	0.1252	0.0817	-0.1071	-0.0666
	(0.0305)	0.0011)	0.0056)	0.0003)	0.0480)	0.0893)	0.0200)	0.1646)
Constant	0.7759	0.0828	0.1621	0.0248	0.5596	1.8618	-0.3147	-3.1946
	(0.0589)	0.0018)	0.0105)	0.0005)	0.0979)	0.1902)	0.0293)	0.2310)

patients = 1785, obs = 58,73 1

Note: standard errors in parentheses.

Table C5. Random Effects Panel Data Results for Other Adults

	Continuous						Probit	
	Ambula-tory Visits	ER Visits	Lab& Radiology Visits	Hospital Admis-sions	Medica-tions	Expend-itures	Any Ambula-tory Care	Any ACS Hospital-ization
SB	-0.2473 (0.0218)	-0.0183 (0.0017)	-0.1818 (0.0068)	-0.0049 (0.0002)	-0.0377 (0.0152)	-0.53 10 (0.0760)	-0.3407 (0.0248)	0.344 1 (0.0994)
SB*D2	-0.0078 (0.0295)	0.0138 (0.0022)	0.059 1 (0.0097)	0.003 1 (0.0002)	-0.0086 (0.0261)	0.0707 (0.0864)	-0.0294 (0.0247)	0.2612 (0.2142)
SB*D3	-0.028 1 (0.0429)	0.0165 (0.0032)	0.0969 (0.0141)	0.0062 (0.0003)	-0.0535 (0.0379)	0.0955 (0.1256)	-0.1239 (0.0377)	0.0006 (0.3227)
SB*D4	-0.0965 (0.0567)	0.0206 (0.0042)	0.1190 (0.0187)	0.0153 (0.0004)	-0.0103 (0.0501)	0.0897 (0.1660)	-0.2317 (0.0476)	0.1363 (0.6087)
SB*D5	-0.2542 (0.0754)	-0.005 1 (0.0057)	0.0429 (0.0248)	0.0119 (0.0005)	-0.0457 (0.0662)	0.0019 (0.2219)	-0.4128 (0.0602)	2.7128 (6814.7)
SB*D6	-0.2137 (0.1003)	0.0339 (0.0075)	0.0597 (0.0328)	0.0194 (0.0007)	-0.2100 (0.0848)	0.1378 (0.2995)	0.1123 (0.0940)	2.7496 (7820.6)
SB*D7	-0.3255 (0.1308)	0.0052 (0.0098)	0.0602 (0.0428)	0.0174 (0.0010)	-0.3378 (0.1112)	0.1002 (0.3891)	-0.0836 (0.1181)	3.1669 (6290.)
SB*D8	-0.1425 (0.1664)	0.0699 (0.0125)	0.1483 (0.0547)	0.0185 (0.0012)	-0.1513 (0.1450)	0.2696 (0.4902)	0.2016 (0.2092)	-0.0698 (171240.)
SB*D9	0.3597 (0.2042)	0.2166 (0.0153)	0.6012 (0.0673)	0.0174 (0.0014)	0.3611 (0.1804)	1.0105 (0.5979)	0.9533 (0.2268)	-0.0902 (893140.)
SB*D10	-0.8250 (0.2513)	-0.1359 (0.0188)	0.0157 (0.0830)	-0.0074 (0.0018)	-0.0768 (0.2246)	-0.1576 (0.7325)	-0.3947 (0.5038)	-3.5133 (235790.)
SB*D11	-0.4642 (0.3315)	-0.0037 (0.0248)	0.1491 (0.1097)	0.0553 (0.0023)	0.3115 (0.3003)	0.5124 (0.9614)	0.2400 (2.5192)	0.0266 (1098500.)
SM	-0.0567 (0.0216)	0.0136 (0.0017)	-0.0489 (0.0067)	0.0019 (0.0002)	0.0250 (0.0150)	-0.3355 (0.0753)	-0.1055 (0.0239)	0.4376 (0.0992)
SM*D2	-0.2247 (0.0310)	0.0014 (0.0023)	-0.0207 (0.0102)	0.0015 (0.0002)	-0.1799 (0.0276)	-0.2715 (0.0907)	-0.2593 (0.0275)	0.0919 (0.2331)
SM*D3	-0.2200 (0.0479)	0.0070 (0.0036)	-0.0060 (0.0158)	0.0004 (0.0003)	-0.2685 (0.0426)	0.3373 (0.1398)	-0.1871 (0.0388)	0.0435 (0.3262)
SM*D4	-0.0696 (0.0668)	0.0028 (0.0050)	0.0240 (0.0221)	0.0083 (0.0005)	0.2716 (0.0598)	-0.0915 (0.1945)	0.0161 (0.0596)	-0.1084 (0.9104)
SM*D5	-0.3855 (0.0957)	0.0097 (0.0072)	-0.1574 (0.0316)	0.0082 (0.0007)	0.1373 (0.0862)	-0.3466 (0.2784)	-0.3837 (0.0713)	-0.5030 (23794.)
SM*D6	-1.4857 (0.6482)	-0.1776 (0.0484)	-0.5530 (0.2 15 1)	-0.0336 (0.0044)	-1.0451 (0.6006)	-2.1294 (1.8647)	-4.0922 (3704.9)	-0.5431 (1029400.)
Black	0.0802 (0.0552)	-0.0138 (0.0043)	0.0188. (0.0171)	-0.0026 (0.0006)	0.1279 (0.0360)	0.1708 (0.1973)	0.2185 (0.0475)	0.1869 (0.1941)
Other	-0.0237 (0.0187)	-0.0442 (0.0014)	-0.0215 (0.0058)	-0.0 125 (0.0002)	-0.1264 (0.0125)	-0.1342 (0.0664)	-0.0284 (0.0197)	-0.3481 (0.0885)
Unknown	-0.0886 (0.0260)	-0.0431 (0.0020)	-0.0352 (0.0082)	-0.0103 (0.0003)	-0.1100 (0.0186)	-0.034 1 (0.0890)	-0.0730 (0.0290)	-0.3341 (0.1794)
Age	0.0064 (0.0010)	-0.0017 (0.0001)	0.0027 (0.0003)	-0.0003 (0.0000)	0.0161 (0.0006)	0.0079 (0.0035)	0.268 1 (0.0606)	0.1567 (0.2574)
Female	0.2070 (0.0188)	-0.0017 (0.0014)	0.1332 (0.0059)	-0.0202 (0.0002)	-0.0169 (0.0128)	0.5118 (0.0662)	0.4696 (0.0213)	0.0526 (0.0886)

patients = 8,654, obs = 84,298

Note: **standard errors in parentheses.**

Table C5. Random Effects Panel Data Results for Other Adults (continued)

	Continuous						Probit	
	Ambula-tory Visits	ER Visits	Lab & Radiology Visits	Hospital Admis-sions	Medica-tions	Expend-itures	Any Ambula-tory Care	Any ACS Hospital-ization
D2	-0.0727 (0.0180)	-0.0100 (0.0013)	-0.0582 (0.0059)	-0.0016 (0.0001)	0.1475 (0.0156)	-0.1747 (0.0532)	-0.0787 (0.0146)	-0.2714 (0.1688)
D3	-0.1441 (0.0288)	-0.0034 (0.0022)	-0.0992 (0.0094)	-0.0031 (0.0002)	0.2685 (0.0248)	-0.1923 (0.0858)	-0.1488 (0.0230)	-0.0630 (0.2528)
D4	-0.0794 (0.0392)	0.0247 (0.0029)	-0.0889 (0.0128)	-0.0049 (0.0003)	0.2933 (0.0337)	-0.1373 (0.1173)	-0.1008 (0.0306)	-0.1641 (0.5543)
D5	-0.0057 (0.0511)	0.0217 (0.0038)	-0.0966 (0.0167)	0.0004 (0.0004)	0.4564 (0.0436)	-0.0585 (0.1538)	-0.0625 (0.0386)	-2.5842 (5814.8)
D6	-0.0207 (0.0645)	-0.0067 (0.0049)	-0.0628 (0.0210)	-0.0072 (0.0005)	0.4543 (0.053 1)	-0.2521 (0.1964)	-0.3155 (0.0613)	-2.5532 (7820.6)
D7	0.0289 (0.0839)	0.0197 (0.0063)	-0.055 1 (0.0274)	0.0038 (0.0006)	0.5492 (0.0704)	-0.2398 (0.2530)	-0.2644 (0.0701)	-2.4508 (6290.)
D8	-0.0802 (0.1035)	-0.0148 (0.0078)	-0.0981 (0.0339)	-0.0108 (0.0008)	0.4719 (0.0887)	-0.3981 (0.3091)	-0.423 1 (0.0928)	-2.64 11 (46541.)
D9	-0.2124 (0.1341)	-0.0963 (0.0101)	-0.3074 (0.0441)	-0.002 1 (0.0010)	0.1208 (0.1174)	-0.46 18 (0.3962)	-0.6865 (0.1177)	-2.6354 (68310.)
D10	0.6197 (0.1828)	0.2553 (0.0137)	0.0730 (0.0603)	0.0248 (0.0013)	0.3 156 (0.1634)	0.3698 (0.5351)	0.0827 (0.3481)	1.0470 (1.5376)
D11	0.0934 (0.2601)	0.0955 (0.0195)	0.0227 (0.0860)	-0.0133 (0.0018)	-0.0823 (0.2363)	-0.7165 (0.7554)	-0.7289 (2.4933)	-2.8545 (519110.)
1988	0.0040 (0.0219)	-0.0111 (0.0016)	0.0212 (0.0072)	-0.0011 (0.0002)	-0.0225 (0.0189)	-0.0978 (0.0654)	-0.1168 (0.0223)	-0.5028 (0.1706)
1989	0.0677 (0.0238)	-0.0139 (0.0018)	0.0230 (0.0078)	-0.0001 (0.0002)	0.0101 (0.0203)	0.1799 (0.0715)	0.1152 (0.0222)	-0.2282 (0.1932)
1990	-0.0980 (0.0244)	-0.0374 (0.0018)	-0.0343 (0.0080)	-0.0034 (0.0002)	0.0624 (0.0206)	-0.0419 (0.0740)	-0.1270 (0.0229)	-0.2160 (0.1866)
1991	-0.0803 (0.0242)	-0.0286 (0.0018)	0.0131 (0.0078)	-0.0057 (0.0002)	0.0125 (0.0197)	-0.1700 (0.0748)	-0.1156 (0.0226)	-0.1704 (0.1901)
1992	0.2395 (0.0249)	-0.0158 (0.0019)	0.1605 (0.0080)	-0.0044 (0.0002)	0.1570 (0.0198)	0.5109 (0.0786)	0.3712 (0.0236)	-0.0760 (0.1896)
Constant	0.3448 (0.0377)	0.1513 (0.0029)	0.1144 (0.0119)	0.0477 (0.0004)	-0.0724 (0.027 1)	1.0471 (0.1287)	-1.0792 (0.0394)	-3.4572 (0.2469)

patients = 8,654, obs = 84,298

Note: standard errors in parentheses.

Table C6. Random Effects Panel Data Results for Other Children

	Continuous						Probit	
	Ambulatory Visits	ER Visits	Lab& Radiology Visits	Hospital Admissions	Medications	Expenditures	Any Ambulatory Care	Any ACS Hospitalization
SB	0.4937 (0.0133)	0.0734 (0.0012)	0.0664 (0.0019)	0.0150 (0.00018)	0.3791 (0.0119)	1.1639 (0.0539)	-0.2528 (0.0206)	-0.2158 (0.1006)
SB*D2	-0.1495 (0.0091)	-0.0287 (0.0008)	-0.0722 (0.0013)	-0.004 1 (0.00013)	-0.1462 (0.0077)	-0.353 1 (0.0377)	-0.0923 (0.0225)	0.3567 (0. 1915)
SB*D3	-0.0385 (0.0099)	0.0083 (0.0010)	-0.024 1 (0.0017)	0.0007 (0.00008)	-0.0568 (0.0124)	-0.0713 (0.0358)	-0.1467 (0.0285)	-0.1074 (0.2985)
SB*D4	-0.062 1 (0.0135)	0.0158 (0.0013)	-0.0064 (0.0023)	-0.0005 (0.00011)	-0.0588 (0.0166)	-0.0687 (0.0489)	-0.054 1 (0.0357)	0.1211 (0.3208)
SB*D5	0.0004 (0.0174)	0.0158 (0.0017)	0.0268 (0.0030)	0.0003 (0.00015)	0.0695 (0.0211)	0.0975 (0.0630)	0.0136 (0.0459)	2.8316 (6711.1)
SB*D6	-0.0 120 (0.0219)	0.0096 (0.0021)	0.0137 (0.0037)	0.0014 (0.00019)	0.0726 (0.0261)	0.1197 (0.0797)	-0.0903 (0.0601)	0.3850 (0.4915)
SB*D7	0.0022 (0.0264)	0.0118 (0.0026)	0.0316 (0.0044)	0.0043 (0.00023)	0.0192 (0.0303)	0.0644 (0.0965)	0.0990 (0.0672)	-2.4814 (02310.)
SB*D8	0.0917 (0.0339)	0.0045 (0.0033)	0.0357 (0.0057)	0.0077 (0.00029)	0.0199 (0.0394)	0.1978 (0.1234)	0.3776 (0.082 1)	3.0949 (508 11 .O)
SB*D9	0.1883 (0.0395)	0.0035 (0.0038)	0.0465 (0.0067)	0.0036 (0.00034)	0.1250 (0.0466)	0.4397 (0.1434)	0.7613 (0.1003)	0.1281 (497750.)
SB*D10	0.3286 (0.0456)	0.0188 (0.0044)	0.0719 (0.0078)	0.0010 (0.00039)	0.3179 (0.0548)	0.8801 (0.1651)	1.2171 (0.1550)	0.1327 (591620.)
SB*D11	0.6214 (0.0593)	0.0462 (0.0058)	0.1332 (0.0102)	0.0035 (0.00050)	0.4045 (0.0733)	1.2837 (0.2137)	0.7333 (0.1734)	3.7062 (129660.)
SM	0.4162 (0.08 12)	0.0224 (0.0080)	0.1538 (0.0 142)	0.0391 (0.00068)	0.2524 (0.1031)	1.2774 (0.29 16)	-0.2020 (0.0203)	-0.1269 (0.0874)
SM*D2	-0.1150 (0.0090)	-0.0 154 (0.0008)	-0.0457 (0.0013)	-0.0018 (0.00013)	-0.1228 (0.0076)	-0.3 175 (0.0374)	-0.1137 (0.0214)	0.1789 (0.1929)
SM*D3	-0.0107 (0.0099)	0.0119 (0.0010)	-0.0195 (0.0017)	0.0017 (0.00008)	-0.0399 (0.0124)	-0.0964 (0.0357)	-0.2047 (0.0276)	0.0924 (0.2797)
SM*D4	-0.0825 (0.0143)	0.0088 (0.0014)	-0.0256 (0.0025)	0.0009 (0.00012)	-0.0725 (0.0177)	-0.1541 (0.0516)	-0.1855 (0.0409)	0.1265 (0.3791)
SM*D5	-0.069 1 (0.0197)	0.0025 (0.0019)	-0.0083 (0.0034)	0.0038 (0.00017)	0.0680 (0.0244)	-0.0560 (0.0708)	-0.0525 (0.0515)	2.9283 (6711.1)
SM*D6	-0.0654 (0.0285)	0.0056 (0.0028)	-0.0121 (0.0050)	0.0086 (0.00024)	0.2273 (0.0360)	0.093 1 (0.1025)	-0.4990 (0.3851)	-2.6781 (265590.)
Black	-0.2397 (0.0497)	-0.0209 (0.0048)	-0.0836 (0.0085)	0.0030 (0.00044)	0.0599 (0.0610)	-0.4276 (0.1810)	0.0583 (0.0446)	-0.0241 (0.2489)
Other	0.0020 (0.0240)	0.0153 (0.0020)	-0.004 1 (0.0032)	-0.0027 (0.00036)	0.0275 (0.0166)	0.0671 (0.1015)	0.0696 (0.0198)	0.0112 (0.0949)
Unknown	-0.0763 (0.0101)	-0.0121 (0.0009)	-0.0149 (0.0014)	-0.0017 (0.00015)	-0.0154 (0.0074)	-0.1117 (0.0424)	0.2333 (0.0299)	0.1382 (0.1539)
Age	-0.1016 (0.0139)	-0.0176 (0.0012)	-0.02 13 (0.0020)	0.0027 (0.00020)	-0.0749 (0.0115)	-0.1276 (0.0574)	-1.9189 (0.0895)	-0.7 103 (0.4095)
Female	-0.0044 (0.0007)	-0.0003 (0.0001)	0.0039 (0.0001)	0.0001 (0.00001)	-0.0118 (0.0005)	-0.0152 (0.0027)	0.0182 (0.0150)	-0.0558 (0.0686)

patients = 9,180, observations = 13 1,254, based on 25% random subsample
Note: standard errors in parentheses.

Table C6. Random Effects Panel Data Results for Other Children (continued)

	Continuous						Probit	
	Ambula-tory Visits	ER Visits	Lab& Radiology Visits	Hospital Admissions	Medica-tions	Expend-itures	Any Ambula-tory Care	Any ACS Hospital-ization
D2	-0.1132 (0.1149)	0.0035 (0.0114)	-0.0067 (0.0203)	0.0006 (000094)	0.2800 (0.1526)	-0.0397 (0.4102)	0.0652 (0.0134)	-0.4398 (0.1197)
D3	0.0095 (0.0065)	-0.0088 (0.0006)	0.0211 (0.0011)	-0.0020 (0.00006)	0.1081 (0.0079)	0.0143 (0.0236)	-0.0369 (0.0175)	-0.4109 (0.1640)
D4	-0.0262 (0.0091)	-0.0180 (0.0009)	0.0070 (0.0015)	-0.0003 (0.00008)	0.0978 (0.0107)	-0.1114 (0.0335)	-0.1035 (0.0217)	-0.2958 (0.2081)
D5	-0.0753 (0.0118)	-0.0203 (0.0011)	-0.0076 (0.0019)	0.0001 (0.00011)	0.0289 (0.0135)	-0.1774 (0.0435)	-0.1465 (0.0283)	-2.9101 (6711.1)
D6	-0.0574 (0.0149)	-0.0150 (0.0014)	-0.0039 (0.0025)	-0.0030 (0.00014)	0.0074 (0.0169)	-0.2555 (0.0554)	-0.1212 (0.0343)	-0.2772 (0.3534)
D7	-0.0797 (0.0177)	-0.0200 (0.0017)	-0.0140 (0.0028)	0.0006 (0.00017)	0.0168 (0.0190)	-0.2120 (0.0663)	-0.1593 (0.0389)	-0.6237 (1.1740)
D8	0.1007 (0.0219)	-0.0170 (0.0021)	-0.0229 (0.0035)	-0.0003 (000021)	0.0026 (0.0236)	-0.2687 (0.0818)	-0.2859 (0.0549)	-2.8342 (50811.)
D9	-0.1154 (0.0255)	-0.0075 (0.0024)	-0.0361 (0.0042)	0.0034 (0.00024)	0.0042 (0.0279)	-0.3895 (0.0950)	-0.4215 (0.0606)	-2.8525 (125370.)
D10	-0.1769 (0.0290)	-0.0191 (0.0028)	-00443 (0.0048)	0.0028 (0.00027)	-0.0642 (0.0325)	-0.4466 (0.1077)	-0.4736 (0.1021)	-2.8744 (180520.)
D11	-0.2193 (0.0366)	-0.0333 (0.0035)	-0.0384 (00061)	0.0022 (0.00033)	-0.0742 (0.0428)	-0.5276 (0.1346)	-0.4438 (0.0743)	-2.7819 (129660.)
1988	-0.0068 (0.0071)	-0.0007 (0.0006)	0.0116 (0.0010)	-0.0020 (0.00011)	-0.0052 (0.0053)	0.0224 (0.0299)	-0.1105 (0.0195)	0.3218 (0.1579)
1989	-0.0322 (0.0082)	-0.0064 (0.0008)	0.0090 (0.0014)	0.0000 (0.00007)	-0.0171 (0.0102)	-0.0570 (0.0299)	0.1226 (0.0181)	0.4190 (0.1738)
1990	0.0460 (0.0086)	-0.0065 (0.0008)	0.0193 (0.0015)	0.0007 (0.00008)	-0.0165 (0.0104)	0.1244 (0.0315)	0.0857 (0.0179)	0.1114 (0.1840)
991	-0.0334 (0.0088)	-0.0136 (0.0008)	-0.0029 (00015)	-0.0022 (0.00008)	-0.0156 (0.0102)	-0.0174 (0.0326)	0.1091 (0.0187)	0.1998 (0.1755)
992	0.0489 (0.0090)	-0.0046 (0.0008)	0.0266 (0.0014)	-0.0042 (0.00009)	-0.0158 (0.0098)	0.0879 (0.0338)	0.1931 (0.0195)	0.2141 (0.1712)
Constant	0.1052 (0.0094)	0.0003 (0.0009)	0.0429 (0.0015)	-0.0044 (0.00010)	0.0808 (0.0097)	0.2237 (0.0360)	-0.6146 (0.0267)	-3.5535 (0.2237)

patients = 9,180, observations = 131,254, based on 25% random subsample
Note: standard errors in parentheses.

Table C7. Logistic Regression Results for Immunizations Among Continuously Enrolled AFDC Children

	6 Month Immuniz. Compliance	Any Immuniz. At 6 Month	12 Month Immuniz. Compliance	Any Immuniz. At 12 Mon.	24 Month Immuniz. Compliance	Any Immuniz. At 24 Mon.
SM	0.060	0.291	0.171	0.624	-0.066	0.567
	(0.122)	(0.112)	(0.140)	(0.158)	(0.178)	(0.238)
SM*Y 1990	-0.140	-0.340	-0.234	-0.397	0.105	-0.502
	(0.153)	(0.142)	(0.176)	(0.197)	(0.22 1)	(0.305)
SM*Y 1991	-0.379	-0.705	-0.487	-0.817	-0.729	-0.998
	(0.144)	(0.135)	(0.164)	(0.190)	(0.312)	(0.429)
SM*Y 1992	-0.90 1	-0.947	-0.570	-1.073	- -	---
	(0.145)	(0.137)	(0.202)	(0.268)		
SB	0.916	1.275	1.053	1.652	0.88 1	1.755
	(0.116)	(0.135)	(0.130)	(0.204)	(0.147)	(0.318)
SB*Y 1990	-0.419	-0.396	-0.313	-0.478	-0.151	-0.376
	(0.151)	(0.175)	(0.168)	(0.260)	(0.192)	(0.441)
SB*Y 1991	-0.422	-0.754	-0.569	-0.796	-0.768	0.236
	(0.142)	(0.166)	(0.158)	(0.256)	(0.315)	(1.091)
SB*Y 1992	-0.778	**-1.028**	-0.586	-1.300	----	----
	(0.145)	(0.173)	(0.229)	(0.399)		
Black	-0.090	-0.087	-0.136	**-0.108**	-0.048	0.120
	(0.071)	(0.07 1)	(0.087)	(0.105)	(0.138)	(0.203)
Other	-0.056	0.090	-0.061	0.23 1	0.067	0.370
	(0.044)	(0.046)	(0.055)	(0.072)	(0.090)	(0.140)
Female	0.056	-0.010	-0.018	0.041	0.128	0.115
	(0.038)	(0.039)	(0.047)	(0.062)	(0.078)	(0.125)
Y'1990	0.257	0.258	0.115	0.223	0.120	0.488
	(0.098)	(0.09 1)	(0.112)	(0.116)	(0.133)	(0.172)
Y'1991	0.446	0.574	0.439	0.729	0.314	0.765
	(0.092)	(0.087)	(0.105)	(0.116)	(0.193)	(0.305)
Y'1992	0.817	0.908	0.816	1.228	----	----
	(0.093)	(0.092)	(0.134)	(0.188)		
Constant	-1.016	0.283	-0.847	0.773	-1.272	1.413
	(0.085)	(0.078)	(0.098)	(0.104)	(0.127)	(0.161)
N	12796	12796	7778	7778	3282	3282

Note: standard errors in parentheses

Table CS. Logistic Regression Results for Well-Child Visits Among Continuously Enrolled AFDC Children

	6 Mo. Well Child Compliance	Any Well Child Visits At 6 Mo.	12 Mo. Well Child Compliance	Any Well Child Visits at 12 Mo.
SM	-0.203 (0.202)	0.155 (0.115)	0.028 (0.280)	0.540 (0.172)
SM*Y1990	-0.044 (0.248)	-0.117 (0.146)	-0.118 (0.339)	-0.259 (0.214)
SM*Y1991	-0.043 (0.234)	-0.500 (0.137)	-0.309 (0.321)	-0.672 (0.207)
SM*Y 1992	-0.600 (0.235)	-0.692 (0.141)	-0.967 (0.443)	-0.827 (0.28 1)
SB	0.904 (0.163)	1.189 (0.143)	1.030 (0.22 1)	1.371 (0.213)
SB*Y 1990	-0.820 (0.2 16)	-0.354 (0.182)	-1.154 (0.296)	-0.465 (0.268)
SB*Y 1991	-0.852 (0.203)	-0.654 (0.173)	-1.049 (0.271)	-0.365 (0.276)
SB*Y1992	-0.844 (0.200)	-0.754 (0.184)	-1.347 (0.434)	-0.447 (0.472)
Black	-0.214 (0.113)	-0.106 (0.072)	-0.060 (0.174)	-0.078 (0.110)
Other	0.041 (0.064)	0.117 (0.047)	0.305 (0.103)	0.385 (0.076)
Female	0.110 (0.055)	-0.013 (0.040)	-0.056 (0.086)	0.018 (0.067)
Y11990	0.310 (0.149)	0.063 (0.093)	0.335 (0.209)	0.104 (0.126)
Y1991	0.34 1 (0.141)	0.294 (0.089)	0.464 (0.198)	0.554 (0.126)
Y1992	0.683 (0.139)	0.699 (0.095)	0.368 (0.252)	0.856 (0.192)
Constant	-2.399 (0.131)	0.556 (0.08 1)	-2.966 (0.193)	1.057 (0.113)
N	12796	12796	7778	7778

Note: standard errors in parentheses

Table C9. Logistic Regression Results for Immunizations Among
Continuously Enrolled Other Children

	6 Month Immuniz. Compliance	Any Immuniz. At 6 Month	12 Month Immuniz. Compliance	Any Immuniz. At 12 Mon.
SM	1.007 (0.308)	0.712 (0.2 10)	1.791 (0.486)	1.872 (0.38 1)
SM*Y 1990	0.504 (0.391)	0.737 (0.275)	-0.013 (0.570)	-0.473 (0.453)
SM*Y 1991	-0.652 (0.329)	-0.756 (0.239)	-1.285 (0.505)	-1.573 (0.422)
SM*Y 1992	-1.499 (0.327)	-1.135 (0.243)	-1.754 (0.541)	-2.250 (0.529)
SB	1.618 (0.301)	1.305 (0.228)	2.019 (0.48 1)	2.076 (0.396)
SB*Y 1990	0.160 (0.389)	0.606 (0.304)	0.311 (0.568)	0.065 (0.5 16)
SB*Y 1991	-0.816 (0.323)	-0.674 (0.265)	-1.069 (0.500)	-1.398 (0.445)
SB*Y 1992	-1.611 (0.323)	-1.129 (0.270)	-1.793 (0.554)	-2.154 (0.599)
Black	-0.097 (0.25 1)	0.283 (0.237)	-0.084 (0.338)	0.073 (0.394)
Other	0.092 (0.095)	0.372 (0.093)	0.107 (0.149)	0.226 (0.171)
Unknown	-0.678 (0.408)	0.039 (0.304)	-0.116 (0.733)	-0.879 (0.743)
Female	0.064 (0.059)	0.040 (0.061)	0.05 1 (0.086)	0.009 (0.107)
Y 1990	-0.068 (0.320)	-0.242 (0.192)	-0.120 (0.497)	0.534 (0.279)
Y1991	1.374 (0.257)	1.226 (0.161)	1.336 (0.435)	1.758 (0.261)
Y 1992	2.190 (0.256)	1.802 (0.166)	2.404 (0.452)	2.477 (0.348)
Constant	-2.393 (0.264)	-0.862 (0.172)	-2.465 (0.450)	-0.457 (0.29 1)
N	5355	5355	2613	2613

Note: standard errors in parentheses

Table C10. Logistic Regression Results for Health Maintenance Visits Among Continuous Enrolled Other Children

	6 Mo. Well Child Compliance	Any Well Child Visits At 6 Mo.	12 Mo. Well Child Compliance	Any Well Child Visits at 12 Mo.
SM	1.611	0.545	1.959	1.689
	(0.436)	(0.208)	(0.774)	(0.406)
SM*Y 1990	0.934	1.125	0.496	-0.239
	(0.688)	(0.276)	(0.991)	(0.499)
SM*Y 1991	-1.383	-0.368	-1.651	-0.972
	(0.464)	(0.238)	(0.802)	(0.454)
SM*Y 1992	-1.974	-0.641	-2.782	-1.599
	(0.460)	(0.241)	(0.883)	(0.550)
SB	1.475	0.970	1.116	2.079
	(0.452)	(0.226)	(0.819)	(0.445)
SB*Y 1990	0.837	1.103	1.065	0.133
	(0.709)	(0.306)	(1.039)	(0.608)
SB*Y 1991	-1.240	-0.269	-0.594	-0.737
	(0.481)	(0.262)	(0.843)	(0.512)
SB*Y 1992	-1.541	-0.566	-1.484	-1.784
	(0.475)	(0.268)	(0.925)	(0.638)
Black	0.538	0.411	0.517	0.269
	(0.279)	(0.249)	(0.439)	(0.460)
Other	-0.039	0.266	0.102	0.204
	(0.126)	(0.093)	(0.232)	(0.182)
Unknown	-0.459	0.020	-0.160	-1.250
	(0.542)	(0.301)	(1.096)	(0.760)
Female	-0.019	-0.047	-0.105	-0.063
	(0.080)	(0.061)	(0.131)	(0.116)
Y'1990	-1.035	-0.608	-0.757	0.582
	(0.634)	(0.188)	(0.924)	(0.283)
Y'1991	1.298	0.795	1.195	1.296
	(0.398)	(0.157)	(0.729)	(0.260)
Y'1992	1.892	1.260	1.724	1.788
	(0.394)	(0.161)	(0.749)	(0.333)
Constant	-3.276	-0.367	-3.568	0.057
	(0.403)	(0.168)	(0.750)	(0.295)
N	5355	5355	2613	2613

Note: standard errors in parentheses

Table C11. OLS Regression of Length of Hospitalizations for Medical or Surgical Reasons

	Adults			Children		
	SSI	AFDC	Other	SSI	AFDC	Other
SB	0.042	0.080	0.456	0.016	-0.065	-0.180
	(0.042)	(0.057)	(0.309)	(0.251)	(0.083)	(0.168)
ESB_88	0.043	-0.010	-0.865	0.429	0.200	-0.021
	(0.063)	(0.096)	(0.435)	(0.382)	(0.126)	(0.258)
ESB_89	-0.189	-0.025	-0.572	-0.481	0.129	· 0.182
	(0.056)	(0.078)	(0.374)	(0.323)	(0.105)	(0.207)
ESB_90	-0.151	-0.061	-0.454	-0.222	0.099	0.043
	(0.055)	(0.077)	(0.368)	(0.343)	(0.104)	(0.213)
ESB_91	-0.187	-0.088	-0.549	-0.108	-0.053	-0.152
	(0.056)	(0.075)	(0.390)	(0.373)	(0.102)	(0.206)
ESB_92	-0.142	-0.038	-0.790	-0.075	-0.008	-0.024
	(0.055)	(0.071)	(0.348)	(0.364)	(0.098)	(0.196)
SM	0.345	-0.038	-0.447	0.146	0.453	0.645
	(0.062)	(0.140)	(0.464)	(0.484)	(0.169)	(0.307)
ESM_88	0.024	0.108	0.584	-0.373	-0.510	-0.528
	(0.073)	(0.149)	(0.507)	(0.528)	(0.182)	(0.33 1)
ESM_89	-0.35 1	0.128	0.496	-0.85 1	-0.472	-0.77 1
	(0.071)	(0.149)	(0.504)	(0.53 1)	(0.181)	(0.33 1)
ESM_90	-0.330	0.054	0.637	-0.250	-0.498	-1.066
	(0.073)	(0.149)	(0.5 14)	(0.885)	(0.180)	(0.338)
ESM_91	-0.400	0.125	0.572	0.060	-0.437	-0.652
	(0.070)	(0.148)	(0.494)	(0.528)	(0.177)	(0.323)
ESM_92	0.004	0.145	0.604	0.183	-0.453	-0.283
	(0.070)	(0.146)	(0.489)	(0.530)	(0.176)	(0.3 18)
SEX	-0.020	-0.148	-0.254	0.171	-0.066	0.040
	(0.012)	(0.021)	(0.071)	(0.084)	(0.021)	(0.041)
BLACK	-0.087	0.020	-0.202	-0.161	0.010	0.097
	(0.020)	(0.032)	(0.166)	(0.145)	(0.038)	(0.115)
OTHER	-0.077	-0.024	-0.156	-0.132	-0.04 1	-0.102
	(0.013)	(0.019)	(0.080)	(0.096)	(0.024)	(0.056)
UNK	0.079	-0.008	-0.161	0.440	0.201	0.321
	(0.021)	(0.040)	(0.129)	(0.168)	(0.054)	(0.082)
ENRAGE	0.001	0.009	0.009	0.018	0.005	0.005
	(0.000)	(0.001)	(0.003)	(0.008)	(0.002)	(0.004)
Y1988	-0.028	-0.026	0.263	-0.088	0.243	0.030
	(0.048)	(0.047)	(0.201)	(0.212)	(0.053)	(0.119)
Y 1989	0.237	0.07 1	0.323	0.324	0.273	0.171
	(0.044)	(0.047)	(0.21 1)	(0.195)	(0.054)	(0.117)
Y1990	0.204	0.064	0.214	0.369	0.234	0.343
	(0.044)	(0.047)	(0.204)	(0.201)	(0.055)	(0.126)
Y 1991	0.193	0.047	0.144	-0.012	0.283	0.116
	(0.044)	(0.046)	(0.206)	(0.212)	(0.052)	(0.112)
Y1992	0.092	-0.023	0.194	0.055	0.250	0.053
	(0.042)	(0.044)	(0.189)	(0.200)	(0.050)	(0.104)
Constant	1.633	1.089	1.161	1.156	0.976	1.313
	(0.037)	(0.05 1)	(0.183)	(0.169)	(0.045)	(0.104)
n	34722	10083	827	659	8266	2553

Note: standard errors in parentheses

Table C12. OLS Regressions for Length of Delivery-Related Hospitalizations

	SSI	AFDC	Other
SB	0.034	-0.049	-0.071
	(0.297)	(0.032)	(0.096)
ESB_88	-0.270	0.148	0.289
	(0.548)	(0.055)	(0.144)
ESB_89	-0.221	-0.039	0.020
	(0.448)	(0.041)	(0.122)
ESB_90	0.036	-0.007	-0.110
	(0.420)	(0.042)	(0.129)
ESB_91	-0.285	-0.080	-0.110
	(0.402)	(0.041)	(0.125)
ESB_92	0.438	-0.104	-0.024
	(0.446)	(0.042)	(0.123)
SM	-1.047	0.144	-0.085
	(0.631)	(0.084)	(0.244)
ESM_88	1.452	0.042	0.290
	(0.723)	(0.088)	(0.264)
ESM_89	0.842	-0.087	0.307
	(0.690)	(0.088)	(0.261)
ESM_90	1.531	-0.214	0.136
	(0.701)	(0.088)	(0.262)
ESM_91	0.926	-0.189	0.065
	(0.680)	(0.087)	(0.258)
ESM_92	1.107	-0.284	-0.037
	(0.696)	(0.087)	(0.255)
SEX	-1.310	-0.740	-0.313
	(0.257)	(0.058)	(0.082)
BLACK	-0.097	0.079	0.023
	(0.182)	(0.019)	(0.081)
OTHER	0.088	-0.045	0.013
	(0.115)	(0.011)	(0.030)
UNK	-0.280	-0.059	0.005
	(0.258)	(0.018)	(0.053)
ENRAGE	0.013	0.004	-0.002
	(0.005)	(0.001)	(0.002)
Y1988	-0.182	-0.128	-0.088
	(0.289)	(0.023)	(0.076)
Y1989	-0.063	-0.104	-0.021
	(0.261)	(0.023)	(0.075)
Y 1990	-0.104	-0.075	0.102
	(0.241)	(0.022)	(0.082)
Y1991	0.015	-0.068	0.025
	(0.244)	(0.022)	(0.071)
Y1992	-0.367	-0.124	-0.029
	(0.257)	(0.021)	(0.066)
Constant	1.976	1.539	1.105
	(0.361)	(0.058)	(0.093)
n	290	25783	3189

Note: standard errors in parentheses

Table C13. Logistic Regressions for Compliance with Pap Smear Recommendations

	SSI 12 Month	AFDC 12 Month	AFDC 24 Month
SM	0.248	-0.346	-0.453
	(0.176)	(0.104)	(0.157)
SM_88	1.817	0.247	-0.276
	(0.791)	(0.216)	(0.360)
SM_89	-0.002	-0.208	-0.973
	(0.564)	(0.209)	(0.399)
SM_90	0.866	-0.136	-0.360
	(0.849)	(0.208)	(0.357)
SM_91	-0.567	0.218	-0.787
	(0.433)	(0.179)	(0.816)
SM_92	-0.448	0.040	___
	(0.900)	(0.305)	
SB	-0.048	-0.447	-1.738
	(0.208)	(0.093)	(0.203)
SB_88	2.347	0.228	1.145
	(0.839)	(0.238)	(0.404)
SB_89	0.934	0.249	1.116
	(0.582)	(0.226)	(0.417)
SB_90	1.998	0.147	1.207
	(0.865)	(0.214)	(0.378)
SB_91	-0.838	0.475	1.404
	(0.619)	(0.188)	(0.726)
SB_92	-0.515	0.014	____
	(1.154)	(0.332)	
Y1988	-1.596	-0.468	-0.245
	(0.725)	(0.147)	(0.220)
Y1989	-0.546	-0.146	-0.173
	(0.409)	(0.131)	(0.192)
Y 1990	-1.558	-0.231	-0.243
	(0.726)	(0.128)	(0.193)
Y1991	0.533	-0.459	-0.740
	(0.292)	(0.113)	(0.360)
Y 1992	0.148	-0.205	----
	(0.489)	(0.170)	
BLACK	0.184	0.157	0.107
	(0.220)	(0.089)	(0.158)
OTHER	0.278	0.188	0.331
	(0.151)	(0.061)	(0.102)
UNK	0.165	-0.163	-0.283
	(0.232)	(0.088)	(0.335)
ENRAGE	0.032	-0.024	-0.046
	(0.011)	(0.005)	(0.008)
Constant	-3.310	-0.333	-0.320
	(0.341)	(0.148)	(0.254)
N	3002	8881	4529

Note: standard errors in parentheses

APPENDIX D

**ESTIMATED COEFFICIENTS FOR MANDATORY HMO
ENROLLMENT IN MONTGOMERY COUNTY, OHIO**

Table D-l. Odds Ratios (and z statistics) for the Probability of Any Ambulatory Days of Care, Montgomery and Summit Counties, 5/88-4/89 and FY93

	Children		Adults	
	County	Participant	County	Participant
Age	.679**	.680	.969	.969
	(.016)	(.016)	(.021)	(.022)
Age squared	1.019**	1.020**	1.000	1.000
	(.002)	(.002)	(.000)	(.000)
Female (male omitted)	.930	.930	2.591**	2.600**
	(.054)	(.054)	(.207)	(.208)
African-American	.628**	.622**	.780	.781**
	(.037)	(.067)	(.052)	(.052)
Non-white, non-African-American (white omitted)	.622**	.629**	.885	.894
	(.101)	(.104)	(.205)	(.208)
Months enrolled in Medicaid	1.321**	1.309**	1.266**	1.262**
	(.014)	(.014)	(.013)	(.014)
Continuously in Medicaid (gap omitted)	.965	.976	1.276**	1.280**
	(.078)	(.080)	(.104)	(.107)
Montgomery Co. (Summit Co. omitted)	.864	.864	.870	.871
	(.075)	(.075)	(.079)	(.078)
Fiscal year 1993 (5/88-4/89 omitted)	1.297*	1.289*	1.090	1.090
	(.141)	(.139)	(.019)	(.118)
Montgomery County (MC) x FY93	.866	.895	1.050	1.002
	(.110)	(.120)	(.132)	(.136)
Late HMO enrollee x MC x FY93	—	1.187	—	1.480**
		(.164)		(.204)
Discontinued enrollee x MC x FY93	—	1.046	—	1.092
		(.131)		(.139)
Never enrolled x MC x FY93	—	.503**	—	.768
		(.070)		(.091)
Number of observations	9,648	9,648	9,971	9.971
Pseudo R-squared	.157	.159	.183	.184
Log likelihood	-4,809	4,795	-4,753	4,745

** p-value < 0.01   * p-value < 0.05

Table D-2. OLS Coefficients (and t statistics) for the Log of the Number of Ambulatory Care Days Among Users, Montgomery and Summit Counties, 5/88-4/89 and FY93

	Children		Adults	
	County	Participant	County	Participant
Intercept	.868**	.865**	.257	.251
	(.050)	(.051)	(.154)	(.155)
Age	-.160**	-.161**	-.022*	-.022*
	(.009)	(.010)	(.010)	(.010)
Age squared	.008**	.008**	.000*	.000*
	(.001)	(.001)	(.000)	(.000)
Female (male omitted)	-.023	-.022	.523**	.523**
	(.023)	(.023)	(.039)	(.039)
African-American	-.260**	-.260**	-.218**	-.216**
	(.023)	(.023)	(.027)	(.027)
Non-white, non-African-American (white omitted)	-.349**	-.352**	-.312*	-.309*
	(.065)	(.065)	(.133)	(.134)
Months enrolled in Medicaid	.088**	.089**	.094**	.095**
	(.005)	(.005)	(.005)	(.005)
Continuously in Medicaid (gap omitted)	.032	.029	.071	.066
	(.038)	(.038)	(.038)	(.039)
Montgomery Co. (Summit Co. omitted)	-.141**	-.141**	-.021	-.021
	(.033)	(.033)	(.035)	(.035)
Fiscal year 1993 (5/88-4/89 omitted)	.177**	.177**	.250**	.250**
	(.039)	(.039)	(.043)	(.043)
Montgomery County (MC) x FY93	-.024	-.007	.018	-.009
	(.047)	(.051)	(.050)	(.054)
Late HMO enrollee x MC x FY93	—	-.037	—	.158**
		(.054)		(.055)
Discontinued enrollee x MC x FY93	—	-.055	—	-.000
		(.051)		(.525)
Never enrolled x MC x FY93	—	.063	—	-.049
		(.078)		(.066)
Number of observations	6,591	6,591	7,022	7,022
Adjusted R-squared	.142	.142	.163	.164

** p-value < 0.01   * p-value c 0.05

Table D-3. Odds Ratios (and z statistics) for the Probability of Any Physician Services, Montgomery and Summit Counties, 5/88-4/89 and FY93

	Children		Adults	
	County	Participant	County	Participant
Age	.680**	.681**	.965	.966
	(.016)	(.016)	(.021)	(.021)
Age squared	1.019**	1.020**	1.000**	1.000
	(.001)	(.001)	(.000)	(.000)
Female (male omitted)	.933	.934	2.445**	2.45**
	(.053)	(.053)	(.191)	(.192)
African-American	.613**	.612**	.786**	.790**
	(.035)	(.035)	(.050)	(.050)
Non-white, non-African-American (white omitted)	.668*	.677*	.895	.903
	(.106)	(.109)	(.207)	(.210)
Months enrolled in Medicaid	1.309**	1.301**	1.263**	1.262**
	(.014)	(.014)	(.013)	(.014)
Continuously in Medicaid (gap omitted)	1.004	1.005	1.292**	1.286**
	(.080)	(.082)	(.103)	(.105)
Montgomery Co. (Summit Co. omitted)	.847	.847*	.800*	.800**
	(.072)	(.071)	(.070)	(.070)
Fiscal year 1993 (5/88-4/89 omitted)	1.305*	1.300*	1.138	1.137
	(.138)	(.137)	(.120)	(.120)
Montgomery County (MC) x FY93	.765*	.766*	1.013	.892
	(.095)	(.100)	(.123)	(.116)
Late HMO enrollee x MC x FY93	—	1.278	—	1.663**
		(.172)		(.219)
Discontinued enrollee x MC x FY93	—	1.009*	—	1.240
		(.121)		(.150)
Never enrolled x MC x FY93	—	.596**	—	.929
		(.084)		(.109)
Number of observations	9,648	9,648	9,971	9,971
Pseudo R-squared	.151	.153	.177	.178
Log likelihood	-5,012.	-5,002	-5,012	-5,003

** p-value < 0.01   * p-value c 0.05

Table D-4. OLS Coefficients (and t statistics) for the Log of the Number of Ambulatory Care Days With Physician Services, Montgomery and Summit Counties, 5/88-4/89 and FY93

	Children		Adults	
	County	Participant	County	Participant
Intercept	.828**	.823**	.015	.011
	(.050)	(.051)	(.146)	(.147)
Age	-.162**	-.162**	-.012	-.012
	(.009)	(.009)	(.010)	(.010)
Age squared	.008**	.008**	.000	.000
	(.001)	(.001)	(.000)	(.000)
Female (male omitted)	-.013	-.013	.449**	.449**
	(.022)	(.022)	(.038)	(.038)
African-American	-.274**	-.274**	-.190**	-.188**
	(.022)	(.022)	(.027)	(.027)
Non-white, non-African-American (white omitted)	-.335**	-.338**	-.324**	-.322**
	(.065)	(.065)	(.122)	(.122)
Months enrolled in Medicaid	.083**	.084**	.093**	.0937**
	(.005)	(.005)	(.005)	(.005)
Continuously in Medicaid (gap omitted)	.042	.041	.053	-.050
	(.036)	(.037)	(.037)	(.038)
Montgomery Co. (Summit Co. omitted)	-.137**	-.137**	-.019	-.020
	(.037)	(.032)	(.034)	(.034)
Fiscal year 1993 (5/88-4/89 omitted)	.152**	.152**	.233**	.233**
	(.037)	(.038)	(.042)	(.042)
Montgomery County (MC) x FY93	-.028	-.021	.037	.014
	(.046)	(.050)	(.049)	(.053)
Late HMO enrollee x MC x FY93	—	-.023	—	.124*
		(.052)		(.054)
Discontinued enrollee x MC x FY93	—	-.029	—	.005
		(.050)		(.051)
Never enrolled x MC x FY93	—	.096	—	-.044
		(.074)		(.062)
Number of observations	6,324	6,324	6,658	6,658
Adjusted R-squared	.149	.149	.155	.155

** p-value < 0.01   * p-value < 0.05

Table D-5. Odds Ratios (and z statistics) for the Probability of Any Hospital Stays, Montgomery and Summit Counties, 5/88-4/89 and FY93

	Children		Adults	
	County	Participant	County	Participant
Age	.313**	.313**	.907**	.908**
	(.019)	(.019)	(.036)	(.035)
Age squared	1.066**	1.067**	1.001**	1.001
	(.004)	(.004)	(.001)	(.001)
Female (male omitted)	1.080	1.079	4.250**	4.269**
	(.100)	(.100)	(.600)	(.603)
African-American	.950	.966	.928	.948
	(.088)	(.090)	(.068)	(.070)
Non-white, non-African-American (white omitted)	.864	.895	.787**	.804
	(.213)	(.225)	(.275)	(.282)
Months enrolled in Medicaid	.942**	.936**	1.094**	1.110**
	(.013)	(.013)	(.015)	(.016)
Continuously in Medicaid (gap omitted)	2.320**	2.332**	1.238	1.198
	(.348)	(.347)	(.141)	(.137)
Montgomery Co. (Summit Co. omitted)	1.325*	1.324*	1.337**	1.334**
	(.182)	(.183)	(.131)	(.131)
Fiscal year 1993 (5/88-4/89 omitted)	1.647**	1.648**	1.015	1.015
	(.284)	(.286)	(.125)	(.125)
Montgomery County (MC) x FY93	.589**	.452**	.724*	.411**
	(.118)	(.102)	(.103)	(.066)
Late HMO enrollee x MC x FY93	—	2.006**	—	3.556**
		(.421)		(.525)
Discontinued enrollee x MC x FY93	—	1.555	—	2.056**
		(.385)		(.300)
Never enrolled x MC x FY93	—	.889	—	2.882**
		(.222)		(.499)
Number of observations	9,648	9,648	9,971	9,971
Pseudo R-squared	.343	.346	.072	.080
Log likelihood	-2,050	-2,040	-3,921	-3,921

** p-value < 0.01   * pvalue < 0.05

Table D-6. OLS Coeffkients (and t statistics) for the Log of the Number of Hospital Days Per Hospitalized Beneficiary, Montgomery and Summit Counties, 5/88-4/89 and FY93

	Children		Adults	
	County	Participant	County	Participant
Intercept	1.095**	1.114	.812*	.791*
	(.132)	(.133)	(.326)	(.320)
Age	-.080*	-.082*	.032**	.031
	(.033)	(.033)	(.023)	(.023)
Age squared	.005*	.005*	-.000	.000
	(.002)	(.002)	(.000)	(.000)
Female (male omitted)	-.029	-.035	-.111	-.110
	(.068)	(.068)	(.107)	(.107)
African-American	.153*	.151*	.033	.034
	(.068)	(.068)	(.054)	(.054)
Non-white, non-African-American (white omitted)	.013	.004	-.531**	-.536**
	(.155)	(.155)	(.163)	(.164)
Months enrolled in Medicaid	.027*	.024*	-.022	-.019
	(.010)	(.011)	(.013)	(.014)
Continuously in Medicaid (gap omitted)	-.l00	-.091	.147*	.140
	(.103)	(.099)	(.083)	(.084)
Montgomery Co. (Summit Co. omitted)	.024	.023	-.132	-.132
	(.090)	(.090)	(.069)	(.069)
Fiscal year 1993 (5/88-4/89 omitted)	-.161	-.160	-.021	-.022
	(.118)	(.118)	(.092)	(.092)
Montgomery County (MC) x FY93	.143	.114	-.036	-.036
	(.141)	(.161)	(.101)	(.113)
Late HMO enrollee x MC x FY93	—	-.001	—	.020
		(.161)		(.095)
Discontinued enrollee x MC x FY93	—	.218	—	-.071
		(.207)		(.091)
Never enrolled x MC x FY93	—	-.079	—	.119
		(.176)		(.145)
Number of observations	854	854	1,517	1,517
Adjusted R-squared	.017	1017	.050	.049

** p-value < 0.01   * p-value c 0.05

Table D-7. OLS Coefficients (and t statistics) for the Log of the Number of Delivery-related Hospital Stays Per Beneficiary, Montgomery and Summit Counties, 5/88-4/89 and FY93

	Children County	Adults County	Adults Participant
Intercept	-.010	.097	.030
	(.010)	(.172)	(.175)
Age	-.022	-.008	-.009
	(.018)	(.018)	(.018)
Age squared	.002	.000	.000
	(.001)	(.000)	(.000)
Female (male omitted)	-.001	.020	.082
	(.005)	(.100)	(.100)
African-American	.003	-.010	-.009
	(.003)	(.023)	(.023)
Non-white, non-African-American (white omitted)	-.003	-.030	-.029
	(.007)	(.040)	(.039)
Months enrolled in Medicaid	.002**	.005	.008
	(.001)	(.005)	(.005)
Continuously in Medicaid (gap omitted)	-.006	.016	.016
	(.011)	(.033)	(.033)
Montgomery Co. (Summit Co. omitted)	.003	.024	.023
	(.003)	(.025)	(.025)
Fiscal year 1993 (5/88-4/89 omitted)	.008	.098**	.099**
	(.006)	(.038)	(.038)
Montgomery County (MC) x FY93	.010	-.111**	-.169**
	(.009)	(.041)	(.042)
Late HMO enrollee x MC x FY93	—	—	.107**
			(.036)
Discontinued enrollee x MC x FY93	—	—	.034
			(.024)
Never enrolled x MC x FY93	—	—	.130**
			(.044)
Number of observations	576	1,041	1,041
Adjusted R-squared	.045	.018	.022

** p-value < 0.01   * p-value < 0.05

Table D-8. OLS Coefficients (and t statistics) for the Log of the Number of Surgery-related Hospital Stays Per Hospitalized Beneficiary, Montgomery and Summit Counties, 5/88-4/89 and FY93

	Children		Adults	
	County	Participant	County	Participant
Intercept	.189	.175	-.022	.033
	(.146)	(.141)	(.181)	(.189)
Age	-.057	-.062	.006	.004
	(.042)	(.042)	(.013)	(.013)
Age squared	.003	.003	-.000	-.000
	(.002)	(.002)	(.000)	(.000)
Female (male omitted)	.109	.109	-.005	-.003
	(.083)	(.084)	(.036)	(.035)
African-American	-.001	.001	.004	.001
	(.065)	(.062)	(.031)	(.032)
Uon-white, non-African-American (white)mitted)	-.123	-.128	-.031	-.035
	(.102)	(.105)	(.086)	(.084)
Months enrolled in Medicaid	.024	.030*	-.008	-.011
	(.013)	(.014)	(.007)	(.008)
Continuously in Medicaid (gap omitted)	-.176	-.216*	.027	.043
	(.097)	(.094)	(.038)	(.039)
Montgomery Co. (Summit Co. omitted)	-.086	-.083	.043	.041
	(.115)	(.114)	(.033)	(.033)
Fiscal year 1993 (5/88-4/89 omitted)	-.023	-.023	.075	.076
	(.103)	(.103)	(.074)	(.075)
Montgomery County (MC) x FY93	-.020	-.051	-.070	-.020
	(.102)	(.109)	(.081)	(.097)
Late HMO enrollee x MC x FY93	—	.211	—	-.037
		(.162)		(.093)
Discontinued enrollee x MC x FY93	—	-.072	—	-.118
		(.086)		(.062)
Never enrolled x MC x FY93	—	.295	—	-.176
		(.175)		(.109)
Number of observations	104	104	257	257
Adjusted R-squared	.083	-.095	-.016	-.012

** p-value < 0.01   * p-value < 0.05

Table D-9. OLS Coefficients (and t statistics) for the Log of the Number of Medical Hospital Stays Per Hospitalized Beneficiary, Montgomery and Summit Counties, 5/88-4/89 and FY93

	Children		Adults	
	County	Participant	County	Participant
Intercept	.087	.107	.177	.129
	(.092)	(.086)	(.239)	(.234)
Age	-.030	-.029	-.013	-.014
	(.022)	(.021)	(.017)	(.017)
Age squared	.002	.002	.000	.000
	(.001)	(.001)	(.000)	(.000)
Female (male omitted)	.027	.009	.008	.005
	(.049)	(.008)	(.041)	(.040)
African-American	.106*	.112*	.001	.002
	(.053)	(.053)	(.038)	(.037)
Non-white, non-African-American (white omitted)	-.111*	-.140*	-.407*	-.487
	(.049)	(.059)	(.285)	(.283)
Months enrolled in Medicaid	.011	.008	.007	.016**
	(.008)	(.008)	(.006)	(.005)
Continuously in Medicaid (gap omitted)	-.044	-.022	-.050	-.098
	(.056)	(.055)	(.066)	(.061)
Montgomery Co. (Summit Co. omitted)	.044	.042	.077	.075
	(.081)	(.081)	(.050)	(.050)
Fiscal year 1993 (5/88-4/89 omitted)	-.054	-.05 1	-.013	-.018
	(.071)	(.071)	(.048)	(.048)
Montgomery County (MC) x FY93	-.054	-.207*	.033	-.071
	(.099)	(.098)	(.071)	(.069)
Late HMO enrollee x MC x FY93	—	.065*	—	.225*
		(.032)		(.112)
Discontinued enrollee x MC x FY93	—	.368**	—	.056
		(.104)		(.100)
Never enrolled x MC x FY93	—	.386*	—	.492
		(.180)		(.116)
Number of observations	265	265	307	307
Adjusted R-squared	.019	.057	.018	.047

** p-value < 0.01   * p-value < 0.05

Table D-10. Odds Ratios (and z statistics) for the Probability of Any Emergency Room Visits, Montgomery and Summit Counties, 5/88-4/89 and FY93

	Children		Adults	
	County	Participant	County	Participant
Age	.739**	.741**	.968**	.968
	(.016)	(.016)	(.020)	(.020)
Age squared	1.015**	1.015**	1.000	1.000
	(.001)	(.001)	(.000)	(.000)
Female (male omitted)	.923	.921	1.291**	1.290**
	(.048)	(.047)	(.101)	(.101)
African-American	.900*	.892*	1.131*	1.130*
	(.047)	(.046)	(.064)	(.064)
Non-white, non-African-American (white omitted)	.700*	.702*	.708**	.710
	(.013)	(.113)	(.190)	(.191)
Months enrolled in Medicaid	1.254**	1.245**	1.212**	1.207**
	(.014)	(.014)	(.014)	(.015)
Continuously in Medicaid (gap omitted)	.859	.878	1.078**	1.095
	(.073)	(.075)	(.096)	(.099)
Montgomery Co. (Summit Co. omitted)	.949	.949	.862**	.863
	(.073)	(.073)	(.065)	(.065)
Fiscal year FY93 (5/88-4/89 omitted)	1.095	1.094	1.285**	1.284**
	(.099)	(.099)	(.117)	(.117)
Montgomery County (MC) x FY93	.970	.971	.927	.914
	(.105)	(.113)	(.099)	(.103)
Late HMO enrollee x MC x FY93	—	.960	—	1.050
		(.114)		(.122)
Discontinued enrollee x MC x FY93	—	1.177	—	1.143
		(.128)		(.117)
Never enrolled x MC x FY93	—	.615**	—	.732*
		(.100)		(.102)
Number of observations	9,648	9,648	9,971	9,971
Pseudo R-squared,	.084	.085	.088	.089
Log likelihood	-5,910	-5,904	-6,030	-6,027

** p-value < 0.01   * p-value < 0.05

Table D-11. OLS Coeffkients (and t statistics) for the Log of the Number of Ambulatory Care Days with ER Visits Per User, Montgomery and Summit Counties, 5/88-4/89 and FY93

	Children		Adults	
	County	Participant	County	Participant
Intercept	.382**	.388**	.278*	.276
	(.051)	(.051)	(.142)	(. 142)
Age	-.100**	-.100**	-.019**	-.019*
	(.009)	(.009)	(.009)	(.009)
Age squared	.005**	.005**	.000*	.000
	(.001)	(.001)	(.000)	(.000)
Female (male omitted)	-.026	-.027	.098**	.097**
	(.022)	(.022)	(.035)	(.035)
African-American	-.045*	-.046*	.016	.016
	(.022)	(.022)	(.026)	(.026)
Non-white, non-African-American (white omitted)	-.044	-.043	.035	.035
	(.072)	(.072)	(.144)	(.144)
Months enrolled in Medicaid	.039**	.037**	.035**	.035**
	(.005)	(.005)	(.005)	(.005)
Continuously in Medicaid (gap omitted)	.031	.040	.034	.036
	(.035)	(.035)	(.033)	(.034)
Montgomery Co. (Summit Co. omitted)	-.035	-.035	.022	.022
	(.032)	(.032)	(.033)	(.033)
Fiscal year 1993 (5/88-4/89 omitted)	.025	.026	.078	.078
	(.038)	(.038)	(.040)	(.040)
Montgomery County (MC) x FY93	-.002	-.014	-.032	-.040
	(.046)	(.049)	(.047)	(.049)
late HMO enrollee x MC x FY93	—	-.012	—	-.008
		(.047)		(.052)
Discontinued enrollee x MC x FY93	—	.064	—	.035
		(.047)		(.044)
Never enrolled x MC x FY93	—	-.028	—	.025
		(.075)		(.061)
Number of observations	3,573	3,513	3,511	3,577
Adjusted R-squared	.073	.073	.035	.034

** p-value < 0.0 1   * p-value < 0.05

Table D-12. Odds Ratios (and z statistics) for the Probability of Any Ambulatory Laboratory or Radiology Services, Montgomery and Summit Counties, 5/88-4/89 and FY93

	Children		Adults	
	County	Participant	County	Participant
Age	.795**	.796**	.932**	.932**
	(.017)	(.017)	(.019)	(.019)
Age squared	1.013**	1.012**	1.001**	1.001**
	(.001)	(.001)	(.000)	(.000)
Female (male omitted)	1.015	1.013	3.416**	3.423**
	(.051)	(.051)	(.264)	(.265)
African-American	.784**	.774**	,899	.902
	(.040)	(.040)	(.053)	(.053)
Non-white, non-African-American (white omitted)	.707*	.702*	.865	.873
	(.106)	(.106)	(.234)	(.236)
Months enrolled in Medicaid	1.260**	1.251**	1.224**	1.223**
	(.014)	(.014)	(.012)	(.130)
Continuously in Medicaid (gap omitted)	.892**	.894	1.228**	1.225*
	(.073)	(.747)	(.097)	(.099)
Montgomery Co. (Summit Co. omitted)	1.028	1.028	1.034	1.034
	(.077)	(.077)	(.082)	(.081)
Fiscal year 1993 (5/88-4/89 omitted)	1.079	1.076	1.265*	1.264*
	(.097)	(.097)	(.122)	(.122)
Montgomery County (MC) x FY93	1.179	1.352**	1.037	.946
	(.126)	(.154)	(.116)	(.114)
ate HMO enrollee x MC x FY93	—	.760**	—	1.509**
		(.089)		(.185)
Discontinued enrollee x MC x FY93	—	.837	—	1.158
		(.089)		(.127)
Never enrolled x MC x FY93	—	.537**	—	.879
		(.079)		(.104)
Number of observations	9,648	9,648	9,971	9,971
Pseudo R-squared	.083	.084	.153	.154
Log likelihood	-6,097	-6,088	-5,709	-5,702

** p-value c 0.01   * p-value < 0.05

Table D-13. OLS Coefficients (and t statistics) for the Log of the Number of Ambulatory Care Days with Lab or Xray Services Per User, Montgomery and Summit Counties, 5/88-4/89 and FY93

	Children		Adults	
	County	Participant	County	Participant
Intercept	.304**	.293**	.389**	.373*
	(.049)	(.050)	(.050)	(.151)
Age	-.051**	-.052**	-.034**	-.034**
	(.009)	(.009)	(.010)	(.010)
Age squared	.004**	.004**	.000**	.000**
	(.001)	(.001)	(.000)	(.000)
Female (male omitted)	.015	.015	.496**	.495**
	(.020)	(.020)	(.040)	(.040)
African-American	-.076**	-.076**	-.086**	-.083**
	(.020)	(.020)	(.026)	(.026)
Non-white, non-African-American (white omitted)	-.101	-.104	-.267*	-.264*
	(.067)	(.067)	(.110)	(.110)
Months enrolled in Medicaid	.024**	.026**	.050**	.052**
	(.005)	(.005)	(.005)	(.005)
Continuously in Medicaid (gap omitted)	.060	.055	.112**	.103**
	(.034)	(.034)	(.038)	(.038)
Montgomery Co. (Summit Co. omitted)	-.060*	-.060*	.055	.054
	(.030)	(.030)	(.033)	(.033)
Fiscal year 1993 (5/88-4/89 omitted)	-.025	-.025	.278**	.278**
	(.036)	(.036)	(.041)	(.041)
Montgomery County (MC) x FY93	.096*	.105*	-.050	-.080
	(.043)	(.046)	(.048)	(.051)
Late HMO enrollee x MC x FY93	—	-.015	—	.180**
		(.050)		(.052)
Discontinued enrollee x MC x FY93	—	-.050	—	-.026
		(.043)		(.048)
Never enrolled x MC x FY93	—	.134**	—	-.010
		(.079)		(.062)
Number of observations	4,186	4,186	5,736	5,736
Adjusted R-squared	.029	.030	.108	.110

** p-value < 0.01   * p-value < 0.05

Table D-14. Odds Ratios (and z statistics) for the Probability of Any Pap Smears Among Women Aged 19-39 Years and Compliance with Immunization Schedules Among Children Aged 2-30 Months, Montgomery and Summit Counties, FY93

	Pap Smears Women Aged 19-39 Years		Immunization Compliance Children 2-30 Months	
	County	Participant	County	Participant
Age	.728**	.718**	.239**	.237**
	(.082)	(.081)	(.099)	(.100)
Age squared	1.004*	1.005*	1.429**	1.437**
	(.002)	(.002)	(.194)	(.200)
Female (male omitted)	—	—	1.048	1.062
			(.172)	(.176)
African-American	.854	.861	.816*	.828
	(.090)	(.091)	(.136)	(.141)
Non-white, non-African-American (white omitted)	.257*	.259*	.863	1.013
	(.141)	(.145)	(.751)	(.894)
Months enrolled in Medicaid	1.147**	1.140**	1.124**	1.120**
	(.023)	(.027)	(.041)	(.043)
Continuously in Medicaid (gap omitted)	1.683**	1.674**	.782	.740
	(.251)	(.258)	(.218)	(.206)
Montgomery Co. (MC) (Summit omitted)	1.279*	1.249*	.952	.944
	(.124)	(.138)	(.164)	(.209)
Late HMO enrollee x MC	—	1.485**	—	1.438
		(.224)		(.376)
Discontinued enrollee x MC	—	.942	—	.765
		(.140)		(.228)
Never enrolled x MC	—	.642*	—	.672
		(.137)		(.217)
Number of observations	3,052	3,052	744	744
Pseudo R-squared	.084	.087	.025	.032
Log likelihood	-1,846	-1,840	-466	-463

** p-value < 0.01   * p-value < 0.05

Table D-15. Odds Ratios (and z statistics) for the Probability of Compliance with Well-Visit Periodicity Schedules Among Children Aged O-5 Years, Montgomery and Summit Counties, FY93

	Children Aged O-2 Years		Children 3-5 Years	
	County	Participant	County	Participant
Age	.143**	.147**	.154*	.164
	(.055)	(.058)	(.241)	(.259)
Age squared	1.809**	1.800**	1.225	1.216
	(.197)	(.202)	(.238)	(.239)
Female (male omitted)	1.078	1.085	.799**	.813
	(.190)	(.194)	(.158)	(.162)
African-American	1.098*	1.089	1.058	1.086
	(.196)	(.199)	(.213)	(.223)
Non-white, non-African-American (white omitted)	1.454	1.614	2.683	3.658
	(.990)	(1.239)	(2.44)	(3.830)
Months enrolled in Medicaid	1.014	1.006	1.167*	1.104
	(.036)	(.038)	(.071)	(.079)
Continuously in Medicaid (gap omitted)	.775	667	.716**	.786
	(.230)	(.205)	(.246)	(.308)
Montgomery Co. (MC) (Summit omitted)	.817**	1.137	1.018	1.081
	(.150)	(.257)	(.206)	(.260)
late HMO enrollee x MC	—	.953	—	1.358
		(.261)		(.466)
Discontinued enrollee x MC	—	.324**	—	.928
		(.124)		(.295)
Never enrolled x MC	—	.306**	—	.167**
		(.108)		(.102)
Number of observations	861	861	638	638
Pseudo R-squared	.051	.071	.027	.039
Log likelihood	-430	-420	-396·	-391

** p-value < 0.01   * p-value < 0.05

APPENDIX E

ESTIMATED COEFFICIENTS FOR THE
FLORIDA MEDIPASS PROGRAM

Table E-l. Log-Odds Ratio (and Confidence interval) for the Probability of HMO Enrollment, Florida Waiver and Comparison Counties, FY93

	Children	Adults
Intercept	.146** (.135-.159)	.027** (.023-.033)
Infant (≤ 12 months)	.678** (.642-.716)	–
Age	1.01 (.995- 1.02)	1.08** (1.07-1.10)
Age squared	.997** (.996-.998)	.999** (.999-.999)
Female (male omitted)	.966** (.941-.991)	1.52** (1.44-1.60)
Hispanic	.797** (.767-.829)	.782** (.749-.815)
African American	1.07** (1.04-1.10)	1.16** (1.12-1.19)
Other race/ethnicity (white omitted)	.659** (.605-.718)	.517** (.468-.571)
Months enrolled in Medicaid	1.16** (1.15-1.17)	1.14** (1.14-1.15)
Non-cash enrollee	.683** (.657-.709)	.796** (.765-.828)
SOBRA enrollee (AFDC cash omitted)	.442** (.428-.457)	.102** (.095-.109)
MediPass county	.825** (.804-.847)	.983** (.957-1.01)
lumber of observations	275,511	122,262
'hi-squared	18.684**	14,536**

** p-value ≤ 0.001   * p-value ≤ 0.01

Table E-2. Normalized Probit Coefficients (and z statistics) for the Probability of Any Ambulatory Days of Care, Florida Waiver and Comparison Counties, FY91 and FY93

	Children		Adults	
	County	Participant	County	Participant
Infant	.003 (0.76)	.015** (4.08)		
Age	-.057** (-59.84)	-.062** (-63.75)	-.008** (-9.73)	-.008** (-9.04)
Age squared	.003** (48.19)	.003** (53.3 1)	.000** (8.21)	.000** (7.29)
Female (mate omitted)	-.022** (-12.55)	-.016** (-9.29)	.200** (4 1.79)	.212** (43.27)
Hispanic	-.081** (-32.36)	-.077** (-29.86)	-.093** (-23.66)	-.088** (-22.04)
African American	.050** (24.55)	.039** (18.49)	.063** (20.53)	.048** (15.28)
Other race/ethnicity (white omitted)	-.035** (-7.06)	-.023** (-4.62)	-.029** (-3.99)	-.026** (-3.57)
Months enrolled in Medicaid	.006** (20.59)	.000 (0.01)	-.012** (-32.08)	-.015** (-38.77)
Non-cash eligibility category	.038** (15.68)	.040** (16.01)	.025** (6.84)	.023** (6.11)
SOBRA eligibility category FY91	-.091** (-29.75)	-.104** (-33.56)	.143** (29.83)	.133** (27.59)
SOBRA eligibility category FY93 (AFDC cash omitted)	-.049** (-18.52)	-.042** (-15.27)	.141** (33.65)	.253** (60.28)
Fiscal year 1993 (FY91 omitted)	.081** (27.60)	.072** (24.42)	.069** (15.93)	.037** (8.65)
MediPass county x FY93	.018** (5.22)		.001 (0.26)	
Late MediPass enrollee		.162** (39.73)		.206** (33.57)
Full-period MediPass enrollee		.211** (49.31)		.226** (33.53)
MediPass disenrollee		.185** (36.58)		.233** (29.48)
Never enrolled in MediPass (FY91 all counties and FY93 control counties omitted)		-.286** (-70.63)		-.223** (-38.42)
Number of observations	356,757	356,757	159,128	159,128
Pseudo R-squared	0.05	0.10	0.04	0.08
Chi-squared	25,872**	48,811**	8,708**	18,344**

NOTE: Fixed effects for county of residence were also included in the regression,
** p-value ≤ 0.001   * p-value ≤ 0.01

Table E-3. Ordinary Least Squares Regression Coefficients (and t statistics) for the Logarithm of the Number of Ambulatory Care Days Among Medicaid Beneficiaries with Ambulatory Care, Florida Waiver and Comparison Counties, FY91 and FY93

	Children		Adults	
	County	Participant	County	Participant
Infant	.024** (4.14)	.026** (4.61)	–	–
Age	-.063** (-38.71)	-.064** (-39.09)	-.009** (-5.78)	-.009** (-5.82)
Age squared	.003** (36.47)	.003** (36.87)	.000** (7.52)	.000** (7.54)
Female (male omitted)	.005 (1.69)	.005 (1.74)	.135** (13.41)	.137** (13.56)
Hispanic	-.002 (-0.47)	-.002 (-0.41)	.008 (1.15)	.008 (1.15)
African American	-.063** (-19.57)	-.065** (-20.00)	-.054** (-9.91)	-.054** (-9.97)
Other race/ethnicity (white omitted)	.050** (6.24)	.049** (6.17)	.044** (3.27)	.044** (3.26)
Months enrolled in Medicaid	.028** (54.75)	.027** (5 1.52)	.041** (52.73)	.040** (51.76)
Non-cash eligibility category	.044** (11.63)	.048** (12.66)	.014 (2.09)	.014 (2.11)
SOBRA eligibility category FY91	.052** (9.83)	.049** (9.40)	.182** (20.27)	.181** (20.12)
SOBRA eligibility category FY93 (APDC-related omitted)	.022** (5.35)	.025** (5.98)	.234** (30.97)	.241** (29.50)
FY93 (FY91 omitted)	.034** (7.17)	.032** (6.75)	.029** (3.70)	.027** (3.41)
MediPass county × FY93	-.019** (-3.43)	–	.062** (6.63)	
Late MediPass enrollee	–	-.029** (-4.59)		.079** (7.18)
Full-period MediPass enrollee		.026** (3.96)		.071** (5.85)
MediPass disenrollee		-.037** (-4.94)		.042* (3.09)
Never enrolled in MediPass (FY91 all counties and FY93 control counties omitted)		-.052** (-7.05)		.oso** (4.62)
Number of observations	197,925	197,925	93,059	93,059
Adjusted R-squared	0.59	0.59	0.54	0.54
statistic	5,550**	5,255**	2,139**	2,021**

NOTE: A constant and fixed effects for county of residence and Ambulatory Diagnostic Groups were also included in the regression.

** p-value ≤ 0.001   * p-value ≤ 0.01

Table E-4. Normalized Probit Coefficients (and z statistics) for the Probability of Any Emergency Room Visits Among Medicaid Beneficiaries with Ambulatory Care, Florida Waiver and Comparison Counties, FY91 and FY93

	Children		Adults	
	County	Participant	County	Participant
Infant	.034** (6.64)	.032** (6.31)	--	--
Age	-.021** (-14.53)	-.021** (-14.26)	-.010** (-8.14)	-.011** (-8.28)
Age squared	.001** (15.16)	.001** (14.89)	.000** (3.30)	.000** (3.39)
Female (male omitted)	-.009** (-3.78)	-.009** (-3.80)	-.063** (-7.76)	-.065** (-7.98)
Hispanic	-.015** (-4.06)	-.015** (-4.09)	-.030** (-5.10)	-.030** (-5.18)
African American	.021** (7.29)	.022** (7.57)	.032** (7.52)	.036** (8.29)
Other racefethnicity (white omitted)	-.080** (-11.46)	-.080** (-11.42)	-.191** (-18.46)	-.189** (-18.27)
Months enrolled in Medicaid	-.001 (-1.15)	.000 (0.07)	.003** (4.60)	.004** (6.88)
Nlon-cash eligibility category	-.031** (-9.22)	-.033** (-9.93)	-.015* (-2.77)	-.015* (-2.81)
SIOBRA eligibility category FY91	-.030** (-6.60)	-.029** (-6.31)	-.066** (-9.41)	-.059** (-8.35)
SOBRA eligibility category FY93 (AFDC cash omitted)	-.032** (-8.43)	-.033** (-8.81)	.013 (2.19)	-.022** (-3.38)
FY93 (FY91 omitted)	-.051** (-12.12)	-.050** (-11.85)	-.039** (-6.32)	-.027** (-4.34)
MediPass county x FY93	-.088** (-17.80)		-.049** (-6.78)	
Late MediPass enrollee		-.082** (-15.15)		-.067** (-7.94)
Full-period MediPass enrollee		-.112** (-19.81)		-.118** (-12.94)
MediPass disenrollee		-.072** (- 11.08)		-.072** (-6.80)
Never enrolled in MediPass (FY91 all counties and FY93 control counties omitted)		-.062** (-9.61)		.012 (1.39)
Number of observations	197,925	197,925	93.059	93,059
Psdeudo R-squared	0.20	0.20	0.21	0.21
Chi-squared	53,278**	53,371**	26,457**	26,696**

NOTE: Fixed effects for county of residence and Ambulatory Diagnostic Groups were also included in the regression.

• * p-value ≤ 0.001   * p-value ≤ 0.01

Table E-5. Ordinary Least Squares Regression Coefficients (and t statistics) for the Logarithm of the Number of Ambulatory Days of Care with Emergency Room Visits Among Medicaid Beneficiaries With Emergency Room Visits, Florida Waiver and Comparison Counties, FY91 and FY93

	Children		Adults	
	County	Participant	County	Participant
Infant	.031** (4.68)	.030** (4.40)	--	--
Age	-.012** (-5.71)	-.011** (-5.52)	-.008** (-4.50)	-.009** (-4.64)
Age squared	.001** (6.15)	.001** (5.96)	.000 (2.01)	.000 (2.14)
Female (male omitted)	-.012** (-3.71)	-.013** (-3.82)	-.013 (-1.23)	-.016 (-1.47)
Hispanic	-.005 (-1.00)	-.005 (-1.02)	-.006 (-0.66)	-.005 (-0.59)
African American	-.005 (-1.23)	-.004 (-0.93)	.016* (2.84)	.019** (3.27)
Other race/ethnicity (white omitted)	-.016 (-1.59)	-.017 (-1.66)	-.072** (-3.81)	-.069** (-3.66)
Months enrolled in Medicaid	.008** (11.74)	.009** (13.30)	.003* (2.78)	.004** (4.13)
Non-cash eligibility category	-.015* (-3.17)	-.017** (-3.72)	-.013 (-1.77)	-.013 (-1.76)
SOBRA eligibility category FY91	-.033** (-5.45)	-.031** (-5.13)	-.053** (-5.00)	-.048** (-4.50)
SOBRA eligibility category FY93 (AFDC cash omitted)	-.019** (-3.58)	-.020** (-3.74)	.034** (3.89)	.002 (0.26)
FY93 (FY91 omitted)	-.042** (-7.50)	-.041** (-7.37)	-.042** (-5.36)	-.034** (-4.28)
MediPass county × FY93	-.073** (-10.86)		-.037** (-3.72)	
Late MediPass enrollee		-.074** (-9.70)		-.065** (-5.53)
Full-period MediPass enrollee		-.109** (-13.20)		-.090** (-6.85)
MediPass disenrollee		-.080** (-8.61)		-.058** (-3.92)
Never enrolled in MediPass (FY91 all counties and FY93 control counties omitted)		-.006 (-0.60)		.027 (2.27)
Number of observations	76.300	76,300	36.771	36.77 1
Adjusted R-squared	0.23	0.23	0.27	0.27
F t e s t	447.5**	426.0**	261.1**	249.1**

NOTE: A constant and fixed effects for county of residence and Ambulatory Diagnostic Goups were also included in the regression.

** p-value ≤ 0.001   * p-value ≤ 0.01

Table E-6. Normalized Probit Coefficients (and z statistics) for the Probability of Any ACS Hospitalizations, Florida Waiver and Comparison Counties, FY91 and FY93

	Children		Adults	
	County	Participant	County	Participant
Infant	.0004 (1.45)	.0004 (1.37)	–	–
Age	-.0004** (-5.03)	-.0004** (-4.90)	-.0001 (-1.60)	-.0001 (-1.55)
Age squared	.0000** (3.97)	.0002** (3.85)	.0000 (2.25)	.0000 (2.20)
Female (male omitted)	-.0000 (-0.42)	-.0001 (-0.47)	-.0023** (-4.25)	-.0022** (-4.14)
Hispanic	-.0001 (-0.39)	-.0001 (-0.40)	-.0001 (-0.26)	-.0001 (-0.24)
African American	.0004* (2.82)	.0004* (2.90)	.0003 (1.16)	.0003 (1.23)
Other race/ethnicity (white omitted)	.0009* (2.83)	.0009* (2.77)	-.0005 (-0.77)	-.0005 (-0.76)
Months enrolled in Medicaid	-.0002** (-9.74)	-.0002** (-8.92)	-.0002** (-6.56)	-.0002** (-6.41)
Non-cash eligibility category	-.0002 (-1.11)	-.0002 (-1.22)	.0000 (0.03)	-.0000 (-0.04)
SOBRA eligibility category FY91	-.0000 (-0.04)	.0000 (0.11)	.0024** (5.45)	.0024** (5.47)
SOBRA eligibility category FY93 (AFDC cash omitted)	.0001 (0.44)	.0001 (0.40)	-.0007 (-1.91)	-.0007 (-1.76)
FY93 (FY91 omitted)	-.0011** (-5.22)	-.0011** (-5.16)	-.0004 (-1.16)	-.0004 (-1.13)
MediPass county x FY93	-.0007** (-3.19)		-.0024** (-6.23)	
Late MediPass enrollee		-.0009** (-3.87)		-.0017** (-4.13)
Full-period MediPass enrollee		-.0010** (-3.79)		-.0024** (-6.21)
MediPass disenrollee		-.0006 (-2.01)		-.0018** (-3.67)
Never enrolled in MediPass (FY91 all counties and FY93 control counties omitted)		.0000 (0.03)		-.0022** (-5.48)
Number of observations	356,757	356,757	159,128	159,128
Pseudo R-squared	0.43	0.43	0.36	0.36
Chi-squared	26,307**	26,326**	10,296**	10,305**

NOTE: Fixed effects for county of residence and Ambulatory Diagnostic Groups were also included in the regression.
** p-value ≤ 0.001   * p-value ≤ 0.01

Table E-8. Normalized Probit Coefficients (and z statistics) for the Probability of Compliance with EPSDT Screening Visit Schedule Among Medicaid Children Aged Two Months to Five Years, Florida Waiver and Comparison Counties, FY91 and FY93

	Aged 2-30 Months		Aged 31 to 60 Months		Aged 2 to 60 Months	
	County	Participar	County	Participant	County	Participant
Infant					-.108** (-31.04)	-.111* (-31.67)
Age	.012** (4.69)	.008** (3.22)	-.071** (-3.66)	-.069** (-3.58)	.047** (17.46)	.043* (15.73)
Age squared	.020** (13.66)	.021** (14.34)	.016** (4.85)	.015** (4.73)	-.006** (-11.94)	-.005* (-10.48)
Female (mate omitted)	.002 (1.41)	.002 (1.39)	.009* (2.86)	.009* (2.84)	.004* (3.00)	.004* (2.98)
Hispanic	-.002 (-1.26)	-.002 (-1.17)	.013* (2.67)	.014* (2.85)	.002 (1.11)	.002 (1.24)
African American	.002 (1.77)	.002 (1.55)	.105** (26.35)	.101** (25.46)	.036** (21.75)	.035** (20.94)
Other race/ethnicity (white omitted)	.004 (1.15)	.004 (1.35)	.026* (2.75)	.030* (3.16)	.010* (2.57)	.011* (2.93)
Months enrolled in Medicaid	-.005** (-25.11)	-.005** (-26.03)	.008** (12.55)	.007** (10.71)	-.002** (-8.53)	-.003** (-11.40)
Non-cash eligibility category	.001 (0.76)	.002 (1.42)	.012 (2.37)	.011 (2.15)	.003 (1.53)	.004 (2.01)
SOBRA eligibility category FY91	.001 (0.49)	.000 (0.26)	-.025** (-4.76)	-.027** (-5.26)	-.007** (-3.18)	-.008** (-3.76)
SOBRA eligibility category FY93 (AFDC cash omitted)	.005* (2.63)	.005* (2.71)	-.005 (-1.08)	-.006 (-1.32)	-.000 (-0.00)	.000 (0.19)
FY93 (FY91 omitted)	.006* (2.85)	.006 (2.54)	-.010 (-1.70)	-.009 (-1.62)	.002 (0.77)	.001 (0.48)
MediPass county × FY93	-.014** (-6.15)		-.010 (1.44)		-.008* (-2.77)	
Late MediPass enrollee		-.013** (-5.45)	—	.044** (5.51)		-.000 (-0.11)
Full-period MediPass enrollee		.002 (0.56)		.040** (5.15)		.017** (4.96)
MediPass disenrollee		-.012** (-3.90)	—	.020 (2.18)		-.003 (-0.72)
Never enrolled in MediPass (FY91 all counties and FY93 control counties omitted)		-.022** (-9.43)	—	-.094** (-12.15)		-.043** (-14.70)
Number of observations	100.028	100,028	68.707	68,707	168,735	168,735
Pseudo R-squared	0.12	0.12	0.12	0.13	0.18	0.18
Chi-squared	4,803**	4,912**	8,914**	9,342**	22,714**	23,187**

NOTE: Fixed effects for county of residence and Ambulatory Diagnostic Groups (except the preventive care group) were also included in the model.

** p-value ≤ 0.001   * p-value ≤ 0.01

Table E-9. Normalized Probit Coefficients (and z statistics) for the Probability of Compliance with the AAP Immunization Schedule Among Medicaid Children Aged 2-30 Months, Florida Waiver and Comparison Counties, FY91 and FY93

	Children Aged 2-30 Months	
	County	Participant
Age	.039** (19.19)	.033** (15.61)
Age squared	-.016** (-11.45)	-.015** (-9.98)
Female (male omitted)	.002 (1.90)	.002 (1.79)
Hispanic	.000 (0.02)	.000 (0.33)
African American	-.001 (-1.10)	-.002 (-1.94)
Other race/ethnicity (white omitted)	-.004 (-1.93)	-.003 (-1.44)
Months enrolled in Medicaid	-.000 (-0.06)	-.001** (-4.36)
Non-cash category	-.004** (-3.31)	-.003* (-2.64)
SOBRA eligibility category FY91	-.002 (-0.87)	-.003 (-1.42)
SOBRA eligibility category FY93 (AFDC cash omitted)	.002 (2.02)	.003 (2.28)
FY93 (FY91 omitted)	.054** (22.07)	.052** (21.31)
MediPass county x FY93	-.006 (-2.32)	
Late MediPass enrollee		-.004 (- 1.68)
Full-period MediPass enrollee		.020** (5.67)
MediPass disenrollee		-.001 (-0.51)
Never enrolled in MediPass (FY91 all counties and FY93 control counties omitted)		-.020** (-9.78)
Number of observations	100,036	100,036
Pseudo R-squared	0.19	0.20
Chi-squared	7,820**	8,365**

NOTE: **Fixed effects for county of residence and Ambulatory Diagnostic Groups (except the preventive care group)** were also included in the model.
• * p-value ≤ u.01   * p-value ≤ 0.01

Table E-10. Normalized Probit Coefficients for the Probability of Pap Smear During the Year Among Female Medicaid Beneficiaries Aged 19-39 Years, Florida Waiver and Comparison Counties, FY91 and FY93

	County	Participant
Age	.000 (0.05)	.000 (0.08)
Age squared	-.000 (-1.10)	-.000 (-1.15)
Hispanic	.003 (0.94)	.003 (1.14)
African American	.019** (8.79)	.017** (7.83)
Other race/ethnicity (white omitted)	-.025** (-4.42)	-.023** (-4.21)
Months enrolled in Medicaid	-.002** (-8.84)	-.002 ** (-10.20)
Non-cash eligibility category	-.003 (- 1.27)	-.004 (-1.54)
SOBRA eligibility category FY91	.047** (9.15)	.040** (8.18)
SOBRA eligibility category FY93 (AFDC cash omitted)	.015** (4.24)	.042** (9.96)
FY93 (FY91 omitted)	.042** (13.21)	.038** (11.98)
MediPass county x FY93	-.015** (-4.10)	
Late MediPass enrollee		.007 (1.55)
Full-period MediPass enrollee		.003 (0.73)
MediPass disenrollee		.015* (2.67)
Never enrolled in MediPass (FY9 1 all counties and FY93 control counties omitted)		-.043** (-11.80)
Number of observations	87,584	87,584
Pseudo R-squared	0.15	0.16
Chi-squared	8,623**	8,955**

NOTE: Fixed effects for county of residence and Ambulatory Diagnostic Groups (except preventive care) were also included in the regression. Pregnant women were **dropped** from the analysis.

** p-value ≤ 0.001   * p-value ≤ 0.01

Table E-11. Normalized Probit Coefficients (and z statistics) for the Probability of Any Outpatient Laboratory or Radiology Services Among Medicaid Beneficiaries With Ambulatory Care, Florida Waiver and Comparison Counties, FY91 and FY93

	Children		Adults	
	County	Participant	County	Participant
Infant	-.073** (-14.62)	-.073** (-14.48)	–	–
Age	-.025** (-17.72)	-.025** (-17.85)	-.004** (-7.59)	-.004** (-7.59)
Age squared	.002** (24.85)	.002** (24.94)	.000** (5.72)	.000** (5.71)
Female (male omitted)	.016** (6.97)	.017** (6.99)	.052** (14.50)	.052** (14.42)
Hispanic	.002 (0.67)	.002 (0.68)	.001 (0.33)	.001 (0.34)
African American	-.01 a** (-6.34)	-.018** (-6.37)	-.001 (-0.62)	-.001 (-0.45)
Other race/ethnicity (white omitted)	-.021* (-2.99)	-.021* (-2.98)	-.011 (-2.31)	-.011 (-2.27)
Months enrolled in Medicaid	.007** (16.81)	.007** (15.36)	.001** (5.84)	.002** (6.34)
Non-cash eligibility category	-.016** (4.90)	-.016** (4.80)	-.001 (-0.48)	-.001 (-0.47)
SOBRA eligibility category FY91	-.005 (-1.13)	-.006 (-1.36)	.024** (7.53)	.025** (7.76)
SOBRA eligibility category FY93 (AFDC cash omitted)	.011* (3.13)	.011* (3.08)	.035** (13.06)	.033** (11.20)
FY93 (FY91 omitted)	-.019** (-4.69)	-.020** (-4.76)	.003 (1.00)	.004 (1.30)
MediPass county x FY93	.005 (0.93)		-.005 (-1.48)	– .
Late MediPass enrollee		.009 (1.68)		-.006 (-1.45)
Full-period MediPass enrollee		.009 (1.55)		-.013* (-3.02)
MediPass disenrollee		.009 (1.36)		-.007 (-1.34)
Never enrolled in MediPass (FY91 all counties and FY93 control counties omitted)		-.014 (-2.15)		.001 (0.32)
Number of observations	197.925	197,925	93,059	93,059
Pseudo R-squared	0.14	0.14	0.21	0.21
Chi-squared	38,256**	38,276"	15,153**	15,166**

NOTE: Fixed effects for county of residence and Ambulatory Diagnostic Groups were also included in the regression.

** p-value ≤ 0.001   * p-value ≤ 0.01

Table E-12. Ordinary Least Squares Regression Coefficients (and t statistics) for the Logarithm of the Number of Ambulatory Days of Care with Laboratory and Radiology Services Among Medicaid Beneficiaries With Some Laboratory or Radiology Services, Florida Waiver and Comparison Counties, FY91 and FY93

	Children		Adults	
	County	Participant	County	Participant
Infant	-0.47** (-6.74)	-.046** (-6.59)		
Age	-.028** (-13.57)	-.028** (-13.65)	-.014** (-8.78)	-.014** (-8.85)
Age squared	.002** (18.56)	.002** (18.66)	.000** (7.76)	.000** (7.80)
Female (male omitted)	.027** (7.86)	.027** (7.87)	.171** (14.96)	.171** (15.01)
Hispanic	.005 (0.93)	.005 (0.95)	.009 (1.15)	.008 (1.11)
African American	-.027** (-6.80)	-.028** (-6.95)	-.022** (-4.04)	-.020** (-3.61)
Other race/ethnicity (white omitted)	.019 (1.98)	.019 (1.95)	.026 (1.83)	.026 (1.87)
Months enrolled in Medicaid	.008** (11.36)	.008** (10.88)	.026** (31.86)	.027** (32.56)
Non-cash eligibility category	.015* (3.17)	.017** (3.58)	.013 (1.89)	.013 (1.86)
SOBRA eligibility category FY91	.022** (3.35)	.021** (3.30)	.149** (16.63)	.154** (17.11)
SOBRA eligibility category FY93 (AFDC cash omitted)	.013 (2.47)	.014* (2.78)	.176** (23.30)	.158** (19.32)
FY93 (FY91 omitted)	-.007 (-1.09)	-.007 (-1.21)	-.040** (-4.95)	-.032** (-4.00)
MediPass county x FY93	-.029** (-4.14)		.087** (9.20)	
Late MediPass enrollee		-.041** (-5.24)		.094** (8.36)
Full-period MediPass enrollee		-.010 (-1.19)		.033* (2.61)
MediPass disenrollee	—	-.036** (-3.83)		.059** (4.16)
Never enrolled in MediPass (FY91 all counties and FY93 control counties omitted)	—	-.029* (-3.07)		.116** (10.61)
Number of observations	112,977	112,977	80.763	8.763
Adjusted R-squared	0.32	0.32	0.42	0.42
F-test	1,007**	952.5**	1,142**	1,080**

NOTE: A constant and fixed effects for county of residence and Ambulatory Diagnostic Groups were also included in the regression.

** p-value ≤ 0.001   * p-value ≤ 0.01

Table E-13. Normalized Probit Coefficients (and z statistics) for the Probability of Any Outpatient Medications, Florida Waiver and Comparison Counties, FY91 and FY93

	Children		Adults	
	County	Participant	County	Participant
Infant	-.009* (-2.62)	-.001 (-0.28)		
Age	-.046** (48.64)	-.049** (-5 1.46)	-.002 (-2.21)	-.001 (-1.43)
Age squared	.002** (37.43)	.002** (41.17)	.000** (4.06)	.000** (3.18)
Female (male omitted)	-.014** (-8.24)	-.010** (-5.70)	.178** (37.79)	.186** (38.96)
Hispanic	-.08 1** (-33.02)	-.077** (-3 1.07)	-.109** (-27.93)	-.105** (-26.60)
African American	-.001 (-0.34)	-.010** (-4.69)	.048** (15.53)	.036** (11.43)
Other race/ethnicity (white omitted)	-.034** (-7.08)	-.025** (-5.02)	-.037** (-5.13)	-.036** (-4.84)
Months enrolled in Medicaid	.018** (60.67)	.013** (43.58)	.001 (2.45)	-.001* (-2.97)
Non-cash eligibility category	.031** (13.00)	.031** (12.58)	.026** (7.01)	.024** (6.36)
SOBRA eligibility category FY91	-.083** (-27.86)	-.091** (-30.72)	.015* (2.94)	.006 (1.22)
SOBRA eligibility category FY93 (AFDC cash omitted)	-.015** (-5.61)	-.010** (-3.75)	.071** (16.59)	.180** (39.94)
FY93 (FY91 omitted)	.035** (11.98)	.028** (9.60)	.038** (8.82)	.009 (2.11)
MediPass county × FY93	-.010* (-2.83)		.000 (0.05)	
Late MediPass enrollee		.139** (33.42)		.206** (31.62)
Full-period MediPass enrollee		.110** (24.77)		.164** (22.47)
MediPass disenrollee		.095** (18.42)		.187** (21.95)
Never enrolled in MediPass (FY91 all counties and FY93 control counties omitted)		-.253** (-67.57)		-.181** (-32.25)
Number of observations	356,757	356,757	159,128	159,128
Pseudo R-squared	0.04	0.07	0.02	0.05
Chi-squared	17,554**	33,281**	4,182**	10,715**

NOTE: Fixed effects for county of residence were also included in the regression.
** p-value ≤ 0.001   * p-value ≤ 0.01

Table E-14. Ordinary Least Squares Regression Coefficients (and t statistics) for the Logarithm of the Number of Medications Among Medicaid Beneficiaries With Medications, Florida Waiver and Comparison Counties, FY91 and FY93

	Children		Adults	
	County	Participant	County	Participant
Infant	.019 (2.36)	.022* (2.75)	--	--
Age	-.058** (-25.08)	-.059** (-25.51)	.007** (3.49)	.007** (3.50)
Age square-d	.003** (21.75)	.003** (22.11)	.000** (4.08)	.000** (4.09)
Female (male omitted)	-.010* (-2.61)	-.010 (-2.52)	.133* (10.19)	.136** (10.40)
Hispanic	-.072** (-12.00)	-.072** (-11.97)	-.215** (-21.94)	-.215** (-21.91)
African American	-.158** (-34.38)	-.159** (-34.47)	-.161** (-23.04)	-.165** (-23.59)
Other race/ethnicity ([white omitted)	-.020 (-1.76)	-.019 (-1.73)	-.107** (-6.11)	-.109** (-6.19)
Months enrolled in Medicaid	.051** (65.19)	.049** (60.78)	.049** (47.16)	.048** (44.55)
Non-cash eligibility category	.037** (6.88)	.039** (7.19)	.029** (3.30)	.029** (3.38)
SOBRA eligibility category FY91	.005 (0.70)	.001 (0.14)	-.042** (-3.42)	-.051** (-4.10)
SOBRA eligibility category FY93 (AFDC cash omitted)	.058** (9.69)	.057** (9.63)	.103** (10.18)	.148** (13.56)
FY93 (FY91 omitted)	.083** (12.19)	.081** (11.91)	-.005 (-0.53)	-.020 (-1.97)
MediPass county x FY93	-.045** (-5.64)		-.007 (-0.57)	
Late MediPass enrollee		-.015 (-1.73)		.027 (1.90)
Full-period MediPass enrollee		-.011 (-1.12)		.081** (5.19)
MediPass disenrollee		-.060** (-5.54)		-.002 (-0.13)
Never enrolled in MediPass (FY91 all counties and FY93 control counties omitted)		-.164** (-14.91)		-.085** (-6.03)
Number of observations	149.975	149,975	75,117	75,117
Adjusted R-squared	0.34	0.35	0.37	0.37
F- test	1,515**	1,440**	848.9**	805.7**

NOTE: A constant and fixed effects for county of residence and Ambulatory Diagnostic Groups were also included in the regression.

** p-value ≤ 0.001   * p-value ≤ 0.01

Table E-15. Normalized Probit Coefficients (and z statistics) for the Probability of Any Non-Delivery Hospital Stays, Florida Waiver and Comparison Counties, FY91 and FY93

	Children		Adults	
	County	Participant	County	Participant
Infant	.013** (11.40)	.013** (11.59)	–	–
Age	-.008** (-25.46)	-.008** (-25.78)	.002** (6.97)	.002** (7.09)
Age squared	.000** (26.06)	.000** (26.46)	-.000* (-2.61)	-.000* (-2.76)
Female (male omitted)	-.006** (-12.85)	-.006** (-12.49)	-.006** (-3.47)	-.005** (-3.50)
Hispanic	-.006** (-8.89)	-.006** (-8.63)	-.015** (-11.62)	-.014** (-11.26)
African American	-.002** (-4.15)	-.003** (-4.58)	-.003* (-3.15)	-.004** (-3.83)
Other race/ethnicity (white omitted)	.011** (7.58)	.011** (7.86)	-.009** (-4.18)	-.009** (-4.12)
Months enrolled in Medicaid	.001** (7.68)	.000** (4.30)	.001** (4.39)	.000* (2.90)
Non-cash eligibility category	.003** (4.31)	.003** (4.12)	-.002 (-1.87)	-.002 (-1.93)
SOBRA eligibility category FY91	-.002 (-2.52)	-.002* (-2.99)	-.011** (-6.54)	-.011** (-6.83)
SOBRA eligibility category FY93 (AFDC cash omitted)	-.003** (-4.17)	-.003** (-3.96)	-.012** (-7.87)	-.004* (-2.64)
FY93 (FY91 omitted)	-.001 (-1.34)	-.001 (-1.70)	.001 (0.55)	-.001 (-0.61)
MediPass county × FY93	-.003** (-3.47)	–	-.003 (-1.93)	–
Late MediPass enrollee	–	.001 (1.22)	–	.009** (3.90)
Full-period MediPass enrollee	–	.000 (0.31)	–	.004 (1.58)
MediPass disenrollee	–	.007** (4.27)	–	.015** (4.87)
Never enrolled in MediPass (FY91 all counties and FY93 control counties omitted)	–	-.013** (-12.75)	–	-.017** (-9.45)
Number of observations	356,757	356,757	159,128	159,128
Pseudo R-squared	0.06	0.07	0.02	0.03
Chi-squared	6,040**	6,392**	1,032**	1,343**

NOTE: Fixed effects for county of residence were also included in the regression.
** p-value ≤ 0.001   * p-value ≤ 0.01

Table E-16. Ordinary Least Squares Regression Coefficients (and t statistics) for the Logarithm of the Number of Inpatient Days Among Medicaid Beneficiaries With Non-Delivery Hospital Stays, Florida Waiver and Comparison Counties, FY91 and FY93

	Children		Adults	
	County	Participant	County	Participant
Infant	.138** (3.93)	.139** (3.96)	--	--
Age	.036** (3.38)	.038** (3.51)	.003 (0.43)	.003 (0.46)
Age squared	-.002 (-2.53)	-.002* (-2.66)	-.000 (-0.01)	-.000 (-0.04)
Female (male omitted)	-.017 (-1.09)	-.017 (-1.12)	-.137** (-3.72)	-.138** (-3.73)
Hispanic	.023 (0.99)	.023 (0.98)	-.019 (-0.50)	-.018 (-0.47)
African American	.076** (4.22)	.076** (4.23)	.043 (1.67)	.043 (1.69)
Other race/ethnicity (white omitted)	.199** (5.75)	.196** (5.65)	.128 (2.06)	.124 (2.00)
Months enrolled in Medicaid	-.003 (-0.89)	-.002 (-0.80)	-.011* (-2.95)	-.012* (-2.98)
Non-cash eligibility category	.003 (0.17)	.001 (0.03)	.029 (0.97)	.027 (0.91)
SOBRA eligibility category FY91	-.042 (-1.70)	-.042 (-1.68)	-.060 (-1.12)	-.060 (-1.11)
SOBRA eligibility category FY93 (AFDC cash omitted)	-.017 (-0.67)	-.020 (-0.77)	-.024 (-0.53)	-.028 (-0.57)
FY93 (FY91 omitted)	-.188** (-7.30)	-.187** (-7.25)	-.123** (-3.27)	-.122** (-3.25)
MediPass county x FY93	.038 (1.26)	–	.041 (0.91)	–
Late MediPass enrollee	–	.021 (0.61)	–	.012 (0.23)
Full-period MediPass enrollee	–	-.016 (-0.40)	–	.021 (0.37)
MediPass disenrollee	–	.105 (2.51)	–	.118 (1.91)
Never enrolled in MediPass (FY91 all counties and FY93 control counties omitted)	–	.062 (1.59)	–	.051 (0.92)
Number of observations	10,530	10,530	5,489	5,489
Adjusted R-squared	0.25	0.25	0.21	0.21
F-test	66.8**	63.4**	29.7**	28.1**

NOTE: A constant and fixed effects for county of residence and Ambulatory Diagnostic Groups were also included in the regression.

• * p-value ≤ 0.001   * p-value ≤ 0.01

Table E-17. Normalized Probit Coefficients for the Probability of Delivery-related Hospital Stays and Ordinary Least Squares Regression Coefficients for the Number of Delivery-related Hospital Days for Women with Deliveries Among Female Medicaid Beneficiares Aged 19-39 Years, Florida Waiver and Comparison Counties, FY91 and FY93

	Probability of a Delivery-related Hospital Stay		Number of Delivery-related Hospital Days[1]	
	County	Participant	County	Participant
Age	-.001 (-0.43)	-.001 (-0.45)	-.003 (-0.57)	-.003 (-0.54)
Age squared	-.000** (-5.84)	-.000** (-5.83)	.000 (1.68)	.000 (1.65)
Hispanic	.030** (7.02)	.029** (7.02)	.010 (0.94)	.010 (0.95)
African American	.020** (6.48)	.021** (6.73)	.039** (4.62)	.039** (4.66)
Other race/ethnicity (white omitted)	.009 (1.07)	.010 (1.13)	-.00l (-0.05)	-.000 (-0.01)
Months enrolled in Medicaid	.003** (6.22)	.004** (6.80)	-.005** (-3.66)	-.005** (-3.64)
Non-cash eligibility category	.010 (2.43)	.010 (2.43)	-.007 (-0.53)	-.007 (-0.56)
SOBRA eligibility category FY91	.098** (28.27)	.098** (28.41)	.036** (3.34)	.036** (3.33)
SOBRA eligibility category FY93 (AFDC cash omitted)	.114** (34.85)	.111** (30.46)	.037** (3.75)	.038** (3.46)
FY93 (FY91 omitted)	-.011 (-2.37)	-.010 (-2.02)	-.065** (-5.04)	-.065** (-4.96)
MediPass county x FY93	.004 (0.65)		.010 (0.75)	
Late MediPass enrollee	–	.011 (1.81)		.035 (2.02)
Full-period MediPass enrollee	–	-.020 (-2.37)		-.018 (-0.78)
MediPass disenrollee		-.009 (-1.06)		.00l (0.03)
Never enrolled in MediPass (FY91 all counties and FY93 control counties omitted)		.012 (1.88)		.006 (0.37)
umber of observations	30,848	30.848	27,175	27.175
eudo R-squared	0.26	0.26	0.14	0.14
ni-squared	5,799**	5,825**	88.6**	83.6**

[1] A constant and fixed effects for Ambulatory Diagnostic Groups (except the pregnancy group) were also included in this regression.
** p-value ≤ 0.001   * p-value ≤ 0.01

Table E-18. Normalized Probit Coefficients (and z statistics) for the Probability of Any Medicaid Payments, Florida Waiver and Comparison Counties, FY91 and FY93

	Children		Adults	
	County	Participant	County	Participant
Infant	.007 (1.90)	.014** (4.90)		
Age	-.041** (-44.52)	-.040** (-5 1.83)	-.007** (-8.30)	-.005** (-6.90)
Age squared	.002** (33.92)	.002** (43.13)	.000** (7.62)	.000** (5.89)
Female (male omitted)	-.028** (-16.87)	-.016** (-11.79)	.169** (35.78)	.196** (39.88)
Hispanic	-.095** (-38.60)	-.076** (-36.00)	-.105** (-27.34)	-.089** (-25.44)
African American	.061** (30.88)	.036** (22.01)	.073** (24.87)	.046** (17.66)
Other race/ethnicity (white omitted)	-.050** (-10.26)	-.026** (-6.50)	-.053** (-7.57)	-.049** (-7.56)
Months enrolled in Medicaid	.002** (7.62)	-.005** (-23.01)	-.017** (-47.71)	-.018** (-58.57)
Non-cash eligibility category	.041** (17.00)	.033** (17.19)	.029** (8.30)	.027** (8.48)
SOBRA eligibility category FY9 1	-.077** (-25.95)	-.077** (-32.56)	.128** (28.35)	.089** (24.62)
SOBRA eligibility category FY93 (AFDC cash omitted)	-.049** (-18.18)	-.033** (-13.43)	.067** (16.13)	.173** (56.97)
FY93 (FY91 omitted)	.086** (30.56)	.056** (25.96)	.080** (19.37)	.030** (8.90)
MediPass county x FY93	.169** (52.08)		.096** (19.57)	–
Late MediPass enrollee		.292** (52.15)		.309** (32.72)
Full-period MediPass enrollee		.286** (20.65)	–	.287** (18.30)
MediPass disenrollee		.239** (24.47)	–	.259** (20.57)
Never enrolled in MediPass (FY91 all counties and FY93 control counties omitted)		-.259** (-73.63)	–	-.203** (-40.13)
Number of observations	356,757	356,757	159,128	159,128
Pseudo R-squared	0. 08	0. 25	0. 05	0. 20
Chi-squared	38,522**	117,113**	11,273**	40,864**

NOTE: Fixed effects for county of residence were also included in the regression.

** p-value ≤ 0.001   * p-value ≤ 0.01

Table E-19. Ordinary Least Squares Regression Coefficients (and t statistics) for the Logarithm of Total Medicaid Payments Among Beneficiaries With Payments, Florida Waiver and Comparison Counties, FY91 and FY93

	Children		Adults	
	County	Participant	County	Participant
Infant	.073** (8.44)	.076** (8.80)		
Age	-.060** (-24.89)	-.060** (-24.72)	-.003 (-1.41)	-.004 (-1.66)
Age squared	.004** (26.09)	.004** (26.25)	.000** (4.68)	.000** (4.98)
Female (male omitted)	-.033** (-7.95)	-.033** (-8.10)	.011 (0.76)	-.006 (-0.46)
Hispanic	.008 (1.29)	.009 (1.36)	-.043** (-3.94)	-.044** (-3.99)
African American	-.014* (-2.80)	-.019** (-3.91)	-.044** (-5.5 1)	-.041** (-5.14)
Other race/ethnicity (white omitted)	-.012 (-1.03)	-.017 (-1.42)	-.065** (-3.22)	-.066** (-3.25)
Months enrolled in Medicaid	.024** (31.04)	.025** (32.05)	.033** (29.29)	.037** (31.80)
Non-cash eligibility category	.017* (3.07)	.030** (5.21)	.011 (1.12)	.015 (1.54)
SOBRA eligibility category FY91	.057** (6.93)	.061** (7.50)	.209** (15.22)	.226** (16.44)
SOBRA eligibility category FY93 (AFDC cash omitted)	-.018* (-2.94)	-.003 (-0.55)	.249** (21.68)	.148** (11.95)
FY93 (FY91 omitted)	-.267** (-35.82)	-.272** (-36.52)	-.411** (-34.48)	-.380** (-31.68)
MediPass county × N93	-.106** (-12.18)		-.062** (-4.42)	
Late MediPass enrollee		-.226** (-23.73)		-.222** (-13.78)
Full-period MediPass enrollee		.015 (1.48)		-.061** (-3.42)
MediPass disenrollee		-.159** (-14.19)		-.185** (-9.32)
Never enrolled in MediPass (FY91 all counties and N93 control counties omitted)		.019 (1.67)		.122** (7.43)
Number of observations	224,206	224.206	103,107	103,107
Adjusted R-squared	0.66	0.66	0.67	0.67
Ftest	8,216**	7,838**	4,097**	3,904**

NOTE: A constant and fixed effects for county of residence and Ambulatory Diagnostic Groups were also included in the regression.

** p-value ≤ 0.001   * p-value 5 0.01

APPENDIX F

**ESTIMATED COEFFICIENTS FOR THE
NE'W MEXICO PRIMARY CARE NETWORK**

Table F-l. Normalized Probit Coefficients (and z statistics) for the Probability of PCN Enrollment and the Probabililty of PCN Disenrollment Conditional on Enrollment, 1993

	PCN Enrollment			PCN Disenrollment		
	Children	AFDC & Other Non-SSI Adult	SSI Adult	children	AFDC & Other Non-SSI Adult	SSI Adult
Infant (≤ 12 months)	-.371**	—	—	-.209**	—	—
	(-26.16)			(-9.84)		
Age	.022**	-.002	.023**	-.004	-.008	-.001
	(11.53)	(-0.93)	(13.40)	(-1.97)	(-2.37)	i-0.22)
4ge squared	-.001**	.000	-.000**	-.000	.000	-.000
	(-9.55)	(0.18)	(-13.55)	(-0.15)	(1.32)	(-0.88)
Age 65+	—	—	-.325**	—	—	.283**
			(-7.08)			(7.88)
Female (male omitted)	-.000	.040**	.062**	-006	.031	-.012
	(-0.04)	(3.89)	(6.57)	(-1.25)	(2.26)	(-0.95)
Hispanic	.024**	.021	-.026	-.002	.002	.058
	(4.47)	(2.31)	(-1.31)	(-0.38)	(0.17)	(1.97)
Native American	-.005	.009	.062**	.036*	.080**	-.008
	(-0.46)	(0.47)	(4.94)	(2.82)	(3.24)	(-0.5 1)
Other race/ethnicity	.044**	.045*	.012	.041**	.048	.000
(white omitted)	(4.68)	(2.79)	(1.05)	(3.63)	(2.31)	(0.00)
Months enrolled in Medicaid	.062**	.060**	.056**	.012**	.016**	.016**
	(99.01)	(56.5 1)	(25.91)	(12.46)	(9.96)	(3.62)
SI children	-.317**	—	—	-.067**	—	—
	(-21.37)			(-4.77)		
Other children	-.022**	—	—	-.014	—	—
AFDC children omitted)	(-4.19)			(-2.44)		
Other adult	—	.016	—	—	.095**	—
AFDC adult omitted)		(1.01)			(3.68)	
Rural county (urban omitted)	-.042**	-.059**	-.024	-.051**	-.058**	-.081**
	(-4.50)	(-3.73)	(-1.29)	(-5.19)	(-3.27)	(-3.49)
Per capita income in county	.004	.007	.003	.009**	.016**	.016*
	(1.91)	(1.74)	(0.69)	(3.61)	(3.62)	(3.04)
Number of primary care physicians per 100K population	.056*	.079	-.019	-.092**	-.152**	-.083
	(2.56)	(2.10)	(-0.44)	(-3.96)	(-3.61)	(-1.62)
Emergency rooms per square mile	-.026**	-.049**	.008	.019	-.012	.001
	(-4.39)	(-4.84)	(0.81)	(2.39)	(-0.68)	(0.13)
Percentage of primary care phsycians participating in PCN	.053**	.111**	-.020	.039	.073	.078
	(3.79)	(4.78)	(-0.79)	(2.52)	(2.53)	(2.44)
Number of observations	39,121	11,697	11,374	29,023	8,775	3,991
Pseudo R-squared	.376	.336	.306	.014	.020	.033
Chi-squared	16805**	4415**	4506**	456**	191**	124.85**

** p-value ≤ 0.001   * p-value ≤ 0.01

Table F-2. Normalized Probit Coefficients (and z statistics, for the Probability of Any Ambulatory Day of Care

	Children		AFDC & Other Adults		SSI Adults	
	County	**Participant**	**County**	**Participant**	**County**	**Participant**
Infant	.058**	.063**	—	—	—	—
	(9.05)	(9.80)				
Age	-.059**	-.060**	-.001	-.001	.003**	.002
	(-46.90)	(-47.27)	(-0.65)	(-0.51)	(3.40)	(2.46)
Age squared	.003**	.003**	-.000	-.000	-.000**	-.000*
	(35.32)	(35.69)	(-0.33)	(-0.42)	(-4.13)	(-2.85)
Age 65+ years	—	—	—	—	-.446**	-.420**
					(-43.53)	(-40.12)
Female (male omitted)	-.017**	-.017**	.180**	.180**	-.118**	-.117 ″
	(-6.30)	(-6.32)	(24.97)	(24.88)	(-19.09)	(-18.761)
Hispanic	-.007	-.007	-.030**	-.031**	.036**	.039**
	(-1.92)	(-3.03)	(-4.55)	(-4.61)	(3.51)	(3.78)
Native American	-.044**	-.044**	-.050**	-.051**	.051	.039‴
	(-8.85)	(-8.81)	(-5.73)	(-5.86)	(5.06)	(3.70,
Other race/ethnicity	-.093**	-.094**	-.105**	-.106**	-.017	-.019*
(white omitted)	(-17.37)	(-17.68)	(-10.49)	(-10.62)	(-2.28)	(-2.59)
Months enrolled in Medicaid	.045**	.044**	.044**	.042**	.029**	.025**
	(119.62)	(111.06)	(67.76)	(61.97)	(26.80)	(22.92)
SSI-related eligibility category	.099**	.103**	—	—	—	—
	(12.93)	(13.52)				
Other eligibility category 1990	.008	.003	.244**	.242**	—	—
	(1.52)	(0.60)	(16.47)	(16.26)		
Other eligibility category 1993	-.012*	-.010	.242**	.243**	—	—
(AFDC-related omitted)	(-3.13)	(-2.48)	(18.80)	(18.93)		
Number of primary care physicians	.226**	.224**	.180*	.172*	.153	.201*
per 100K population	(6.10)	(6.05)	(2.79)	(2.68)	(2.21)	(2.87)
1993 (1990 omitted)	.115**	.113**	.098**	.097**	.116**	.120**
	(20.20)	(19.95)	(10.40)	(10.34)	(10.60)	(10.98)
PCN county x 1993	-.029**	—	-.052**	—	-.032	—
	(-4.51)		(-4.53)		(2.41)	
Late PCN enrollee	—	-.007	—	-.010	—	.207**
		(-0.90)		(-0.67)		(7.78)
Full-period PCN enrollee	—	-.007	—	-.034	—	.195**
		(-1.00)		(-2.48)		(10.96)
PCN disenrollee	—	-.011	—	-.024	—	.242**
		(-1.32)		(-1.53)		(9.29)
Ever enrolled in PCN	—	-.081**	—	-.119**	—	-.134**
(1990 all counties and 1993		(-10.12)		(-8.30)		(-9.77)
control counties omitted)						
Number of observations	116,366	116,366	35,747	35.747	35,211	35,211
Pseudo R-squared	.163	.164	.177	.179	.182	.199
chi-squared	23,168**	23,307**	7713**	7788**	8863**	9698**

NOTE: Fixed effects for county of residence were also included in the regression.
** p-value ≤ 0.001 * p-value ≤ 0.01

Table F-3. Ordinary Least Squares Regression Coefficients (and t statistics) for the Logarithm of the Number of Ambulatory Care Days Among Enrollees with Ambulatory Care

	Children		AFDC & Other Adults		SSI-Adults	
	County	Participant	County	Participant	County	Participant
Infant	-.041**	-.044**	—	—	—	—
	(-4.57)	(4.98)				
Age	-.064**	-.061**	-.011**	-.011**	.013**	.013*
	(-35.26)	(-33.65)	(-4.36)	(-4.34)	(5.80)	(5.98)
Age squared	.003**	.003**	.000**	.000**	-.000**	-.000*
	(28.68)	(27.75)	(5.77)	(5.75)	(-5.60)	(-5.79)
Age 65+ years	—	—	—	—	-.271**	-.278*
					(-9.11)	(-9.31)
Female (male omitted)	-.008	-.005	.070**	.070**	.096**	.094**
	(-2.11)	(-1.29)	(5.59)	(5.60)	(6.34)	(6.23)
Hispanic	-.044**	-.050**	-.036**	-.036**	-.017	-.017
	(-9.18)	(-10.46)	(-3.86)	(-3.88)	(-0.71)	(-0.65)
Native American	.010	.017	-.039*	-.039*	-.050	-.045
	(1.40)	(2.39	(-2.98)	(-3.00)	(-2.29)	(-2.06)
Other race/ethnicity	-.087**	-.078**	-.108**	-.109**	-.007	-.005
(white omitted)	(-12.21)	(-10.95)	(-7.50)	(-7.54)	(-0.41)	(-0.30)
Months enrolled in Medicaid	.033**	.034**	.030**	.030**	.055**	.056**
	(52.75)	(52.97)	(27.35)	(25.47)	(17.26)	(17.62)
SSI-related eligibility category	.296**	.294**	—	—	—	—
	(27.79)	(27.70)				
Other eligibility category 1990	-.038**	-.039**	.157**	.154**	—	—
	(-4.96)	(-5.13)	(5.97)	(5.83)		
Other eligibility category 1993	.027**	.016*	.349**	.351**	—	—
(AFDC-related omitted)	(5.32)	(3.03)	(16.74)	(16.82)		
Number of primary care physicians	-.052	-.056	-.015	-.023	.351	.309
per 100K population	(-1.08)	(-0.90)	(-0.16)	(-0.25)	(2.07)	(1.82)
1993 (1990 omitted)	-.108**	-.106**	-.150**	-.150**	.071*	.065
	(-13.64)	(-13.32)	(-10.84)	(-10.90)	(2.57)	(2.34)
PCN county x 1993	.107**	—	.111**	—	.095*	—
	(12.09)		(6.72)		(2.88)	
Late PCN enrollee	—	.100**	—	.126**	—	.042
		(9.70)		(6.36)		(0.89)
Full-period PCN enrollee	—	.108**	—	.121**	—	.078
		(10.79)		(6.60)		(2.11)
PCN disenrollee	—	.090**	—	.104**	—	-.014
		(8.31)		(5.15)		(-0.29)
Never enrolled in PCN	—	.138**	—	.080**	—	.156**
(1990 all counties and 1993		(12.50)		(3.71)		(4.31)
control counties omitted)						
Number of observations	81,429	8 1,429	25,095	25,095	16,711	16,711
Adjusted R-squared	641	.637	.626	.626	.439	.440
F statistic	1960.1**	1881.4**	583.1**	560.0**	185.32**	178.30**

NOTE: A constant and fixed effects for county of residence and Ambulatory Diagnostic Groups were also included in the regression.
** p-value ≤ 0.001   * p-value ≤ 0.01

Table F-4. Normalized Probit Coefficients (and z statistics) for the Probability of Any Emergency Room Visits Among Enrollees with Ambulatory Care

	Children		AFDC & Other Adults		SSI Adults	
	County	Participant	County	Participant	County	Participant
Infant	-.029**	-.030**	—	—	—	—
	(-4.29)	(-4.42)				
Age	-.025**	-.025**	.007**	-.007**	.003*	.003
	(-16.82)	(-16.72)	(-3.45)	(-3.41)	(2.82)	(2.36)
Age squared	.001**	.001**	.000	.000	-.000**	-.000**
	(13.09)	(13.03)	(1.08)	(1.05)	(-4.06)	(-3.59)
Age 65+ years	—	—	—	—	-.035*	-.030
					(-2.60)	(-2.23)
Female (male omitted)	.013**	.013**	-.035**	-.034**	-.010	-.010
	(4.07)	(4.09)	(-3.39)	(-3.36)	(-1.77)	(-1.66)
Hispanic	-.005	-.005	.004	.004	-.027*	-.026*
	(-1.16)	(-1.17)	(0.55)	(0.55)	(-2.96)	(-2.94)
Native American	-.052**	-.052**	-.031*	-.032*	.025*	.022*
	(-8.92)	(-8.93)	(-2.98)	(-3.01)	(3.04)	(2.83)
Other race/ethnicity	-.048**	-.048**	-.036*	-.037**	-.018*	-.018*
(white omitted)	(-8.41)	(-8.39)	(-3.24)	(-3.26)	(-2.58)	(-2.73)
Months enrolled in Medicaid	.004**	.005**	.003*	.002*	.001	-.001
	(8.40)	(8.45)	(3.10)	(2.63)	(0.79)	(-1.02)
SSI-related eligibility category	-.038**	-.039**	—	—	—	—
	(-4.43)	(-4.50)				
Other eligibility category 1990	-.020**	-.020**	.014	.013	—	—
	(-3.35)	(-3.23)	(0.68)	(0.63)		
Other eligibility category 1993	-.022**	-.022**	-.002	-.002	—	—
(AFDC-related omitted)	(-5.34)	(-5.34)	(-0.11)	(-0.09)		
Number of primary care physicians	-.257**	-.256**	-.205*	.205*	-.040	-.027
per 100K population	(-6.14)	(-6.12)	(-2.76)	(-2.76)	(-0.61)	(-0.42)
1993 (1990 omitted)	.008	.008	.022	.022	-.039**	-.035**
	(1.16)	(1.18)	(1.99)	(1.98)	(-3.63)	(-3.36)
PCN county x 1993	-.025**	—	-.012	—	.008	—
	(-3.40)		(-0.89)		(0.60)	
Late PCN enrollee	—	-.028**	—	-.004	—	.037
		(-3.44)		(-0.24)		(2.10)
Full-period PCN enrollee	—	-.024*	—	-.016	—	.027
		(-2.94)		(-1.11)		(1.97)
PCN disenrollee	—	-.027**	—	-.003	—	.054*
		(-3.18)		(-0.21)		(2.94)
Never enrolled in PCN	—	-.017	—	-.023	—	-.063**
(1990 all counties and 1993 control counties omitted)		(-1.89)		(-1.41)		(-4.87)
Number of observations	81,429	81,429	25,095	25,095	16,711	16,711
Pseudo R-squared	.193	.193	.193	.193	.277	.283
Chi-squared	18,064**	18,067**	5599**	5602"	4533**	4628**

NOTE: Fixed effects for county of residence and Ambulatory Diagnostic Groups were also included in the regression.
** p-value ≤ 0.001 * p-value ≤ 0.01

Table F-5. Ordinary Least Squares Regression Coefficients (and t statistics) for the Logarithm of the Number of Ambulatory Days of Care with Emergency Room Visits Among Enrollees With Emergency Room Visits

	Children		AFDC & Other Adults		SSI Adults	
	County	Participant	County	Participant	County	Participant
Infant	-.064**	-.064**	—	—	—	—
	(-5.13)	(-5.10)				
Age	-.031**	-.031**	-.009	-.009	.001	.000
	(-11.29)	(-11.15)	(-2.02)	(-2.00)	(0.11)	(0.04)
Age squared	.002**	.002**	.000	.000	-.000	-.000
	(9.56)	(9.45)	(1.34)	(1.32)	(-1.07)	(-1.00)
Age 65+ years	—	—	—	—	.070	.066
					(1.19)	(1.12)
Female (male omitted)	.000	.000	-.026	-.027	-.047	-.047
	(0.08)	(0.07)	(-1.34)	(-1.37)	(-2.17)	(-2.18)
Hispanic	-.004	-.004	-.025	-.024	-.014	-.015
	(-0.59)	(-0.55)	(-1.84)	(-1.82)	(-0.38)	(-0.40)
Native American	.019	.019	-.022	-.022	-.002	-.003
	(1.58)	(1.58)	(-0.97)	(-0.96)	(-0.07)	(-0.10)
Other race/ethnicity	.004	.004	-.035	-.035	-.001	-.002
(white omitted)	(0.31)	(0.33)	(-1.52)	(-1.50)	(-0.04)	(-0.06)
Months enrolled in Medicaid	.007**	.007**	.002	.003	.000	-.001
	(7.19)	(6.97)	(1.03)	(1.56)	(0.02)	(-0.17)
SSI-related eligibility category	-.022	-.022	—	—	—	—
	(-1.32)	(-1.31)	.024	.029		
Other eligibility category 1990	-.016	-.016	(0.60)	(0.72)	—	—
	(-1.39)	(-1.35)	-.008	-.008		
Other eligibility category 1993	-.013	-.013	(-0.27)	(-0.27)	—	—
(AFDC-related omitted)	(-1.68)	(-1.73)				
Number of primary care physicians	-.230*	-.230*	.019	.034	.027	.031
per 100K population	(-2.89)	(-2.90)	(0.13)	(0.22)	(0.11)	(0.13)
1993 (1990 omitted)	.028	.028	.044	.045	-.012	-.011
	(2.27)	(2.28)	(2.03)	(2.08)	(-0.32)	(-0.29)
PCN county x 1993	-.036*	—	-.039	—	.003	—
	(-2.58)		(-1.51)		(0.08)	
Late PCN enrollee	—	-.030	—	-.054	—	.046
		(-1.88)		(-1.83)		(0.80)
Full-period PCN enrollee	—	-.040*	—	-.052	—	-.007
		(-2.64)		(-1.86)		(-0.14)
PCN disenrollee	—	-.036	—	-.031	—	.034
		(-2.19)		(-1.02)		(0.60)
Never enrolled in PCN	—	-.034	—	.009	—	-.056
(1990 all counties and 1993		(-2.00)		(0.27)		(-0.90)
control counties omitted)						
Number of observations	21,327	21.327	6,666	6,666	3,211	3,211
Adjusted R-squared	.184	.184	.230	.230	.275	.276
F test	66.05**	63.48**	28.59**	27.53**	18.18**	17.50**

NOTE: A constant and fixed effects for county of residence and Ambulatory Diagnostic Coups were also included in the regression.
** p-value ≤ 0.001   * p-value ≤ 0.01

Table F-6. Normalized Probit Coefficients (and z statistics) for the Probability of Any ACSC Hospitalizations

	Children		AFDC & Other Adults		SSI Adults	
	county	Participant	County	Participant	County	Participant
Infant	.003* (2.68)	.003* (2.58)	—	—	—	—
Age	-.007** (-24.80)	-.007** (-24.53)	.000 (0.92)	.000 (0.91)	.001** (3.65)	.001*) (3.26)
Age squared	.000** (17.67)	.000** (17.49)	-.000 (-0.17)	-.000 (-0.15)	-.000 (-1.69)	-.000 (-1.23)
Age 65+ years	—	—	—	—	-.042** (-11.28)	-.037** (-10.03)
Female (male omitted)	.002* (3.06)	.002* (3.06)	.001 (0.38)	.001 (0.41)	-.007** (-3.36)	-.006* (-3.16)
Hispanic	.000 (0.27)	.000 (0.29)	-.004* (-2.76)	-.004* (-2.75)	-.008 (-2.38)	-.008 (-2.34)
Native American	-.001 (-0.94)	-.001 (-0.96)	-.006* (-2.91)	-.006* (-2.92)	-.002 (-0.73)	-.003 (-1.06)
Other race/ethnicity (white omitted)	.002 (2.31)	.002 (2.34)	-.004 (-2.05)	-.004 (-2.05)	-.006 (2.37)	-.006 (-2.53,
Months enrolled in Medicaid	.001** (15.16)	.001** (14.94)	.002** (9.91)	.002** (9.07)	-.000 (-1.38)	-.001* (-2.86)
SI-related eligibility category	.059** (21.79)	.059** (21.62)	—	—	—	—
Other eligibility category 1990	-.001 (-1.26)	-.001 (-1.12)	.019* (2.91)	.018* (2.86)	—	—
Other eligibility category 1993 AFDC-related omitted)	.001 (0.99)	.001 (0.91)	.029** (5.83)	.029** (5.83)	—	—
Number of primary care physicians per 100K population	.010 (1.22)	.010 (1.27)	-.007 (-2.00)	-.008 (-2.04)	.016 (0.71)	.020 (0.87)
1993 (1990 omitted)	.005** (4.35)	.005** (4.40)	.004 (2.24)	.004 (2.21)	.008 (2.19)	.008 (2.33)
CN county x 1993	-.003* (-2.73)	—	-.006* (-2.57)	—	-.001 (-0.14)	—
rte PCN enrollee	—	-.004* (-2.77)	—	-.003 (-1.27)	—	.013 (1.61)
III-period PCN enrollee	—	-.004** (-3.33)	—	-.005 (-2.21)	—	.014 (2.45)
CN disenrollee	—	-.002 (-1.44)	—	-.006 (-2.26)	—	.040** (4.47)
ever enrolled in PCN 1990 all counties and 1993 control counties omitted)	—	-.002 (-1.63)	—	-.007* (-2.68)	—	-.014* (-3.15)
Number of observations	116,366	116,366	34,338	34,338	35,178	35,178
Pseudo R-squared	.113	.113	.040	.040	.030	.038
n-squared	2554.6**	2560.9**	220.5**	223.6**	349.3**	435.8**

NOTE: Fixed effects for county of residence and Ambulatory Diagnostic Groups were also included in the regression for SSI enrollees. However, because in some counties there *were* no hospitalizations for ACS conditions amog the AFDC and other adult enrollees, we replaced the fixed effects with a set of county-level variables, including whether the county was designated as rural, per capita income, the number of emergency rooms per square mile. and the percentage of primary care physicians participating in PCN.

** p-value 6 0.001   * p-value ≤ 0.01

Table F-7. Normalized Probit Coefficients (and z statistics) for the Probability of Referrals During the EPSDT Visits Among Enrollees Aged O-17 Years with EPSDT Visits

	Children	
	County	Participant
Infant	.030**	.026*
	(3.51)	(3.04)
Age	.012**	.012**
	(6.27)	(6.25)
Age squared	-.000	-.000
	(2.28)	(2.31)
Female (male omitted)	.005	.005
	(1.17)	(1.20)
Hispanic	-.011	-.011
	(-2.21)	(-2.26)
Native American	-.024*	-.025*
	(-2.73)	(-2.77)
Other race/ethnicity (white omitted)	-.034**	-.033**
	(-4.03)	(-3.99)
Months enrolled in Medicaid	-.003**	-.002**
	(-4.07)	(-2.90)
SSI-related category	.045**	.042**
	(4.00)	(3.73)
Other eligibility category 1990	-.035**	-.033**
	(-4.27)	(-3.96)
Other eligibility category 1993 (AFDC-related omitted)	.007	.007
	(1.40)	(-1.30)
Number of primary care physicians per 1 OOK population	-.143	-.144
	(-2.46)	(-2.48)
19`93 (1990 omitted)	.027*	.027*
	(2.90)	(2.93)
PCN county x 1993	.066**	—
	(6.39)	
Late PCN enrollee	—	.057**
		(4.68)
Full-period PCN enrollee	—	.075**
		(6.19)
PCN disenrollee	—	.053**
		(4.14)
Never enrolled in PCN (1990 all counties and 1993 control counties omitted)	—	.098**
		(7.32)
Number of observations	36.22 1	36.221
Pseudo R-squared	.136	.136
Chi-squared	4867.1**	4886.9**

NOTE: Fixed effects for county of residence and Ambulatory Diagnostic Goups (except the preventive care group) were also included in the regression.
** p-value ≤ 0.001   * p-value ≤ 0.01

Table F-8. Normalized Probit Coefficients (and z statistics) for the Probability of Compliance with EPSDT Screening Visit Schedule Among Children Aged Two Months to Five Years

	Aged 230 Months		Aged 30 to 60 Months		Aged 2 to 60 Months	
	County	Participant	County	Participant	County	Participan
Age	-.030*	-.037*¹	-.188*¹	-.187**	.034*¹	.029*
	(-2.74)	(-3.27)	(-4.72)	(-4.70)	(5.88)	(4.97)
Age squared	.033*¹	.032*¹	.031*¹	.031**	.004*	.005*
	(6.49)	(6.32)	(4.83)	(4.81)	(2.09)	(3.56)
Female (male omitted)	-.000	.000	.016*	.016*	.008	.008
	(-0.06)	(0.08)	(2.62)	(2.61)	(1.92)	(1.98)
Hispanic	-.013	-.013	.000	B00	-.002	-.003
	(-2.23)	(-2.33)	(0.07)	(0.05)	(-0.52)	(-0.69)
Native American	-.070**	-.070**	-.100**	-.100**	-.082**	-.082**
	(-7.01)	(-7.04)	(-8.93)	(-8.96)	(-10.88)	(- 10.88)
Other race/ethnicity	-.104**	-.105**	-.109	-.109**	-.109**	-.110**
[white omitted]	(- 12.99)	(-13.16)	(-9.68)	(-9.70)	(-15.91)	(- 16.06)
Months enrolled in Medicaid	-.020**	-.022**	.020**	.019**	-.002**	-.003**
	(-25.5 1)	(-26.35)	(20.25)	(18.83)	(-3.88)	(-4.9 1)
SI-related eligibility category	.038	.038	-.014	-.012	.035	.038
	(I.22)	(1.23)	(-0.62)	(-0.50)	(1.94)	(2.09)
Other eligibility category 1990	.037**	.032**	.022	.021	.018*	.015
	(4.27)	(3.69)	(1.99)	(1.91)	(2.63)	(2.20)
Other eligibility category 1993	.054**	.058**	-.006	-.005	.036**	.039**
(AFDC-related omitted)	(8.15)	(8.71)	(-0.76)	(-0.70)	(7.12)	(7.68)
Number of children per child health provider	.007	.008	.021**	.022**	.015**	.015**
	(1.47)	(1.58)	(3.27)	(3.31)	(3.62)	(3.62)
1993 (1990 omitted)	.039**	.038**	-.031	-.032	.001	-.001
	(3.54)	(3.42)	(-2.47)	(-2.48)	(0.08)	(-0.07)
PCN county x 1993	.019	—	-.001	—	.015	—
	(1.67)		(-0.09)		(1.64)	
Late PCN enrollee	—	.027	—	.007	—	-.006
		(1.98)		(0.43)		(-0.54)
Full-period PCN enrollee	—	.114**	—	.001	—	.054**
		(6.48)		(0.09)		(4.87)
PCN disenrollee	—	.061**	—	.005	—	.036*
		(3.73)		(0.32)		(3.11)
Never enrolled in PCN	—	-.022	—	-.029	—	-.012
1990 all counties and 1993 control counties omitted)		(-1.81)		(-1.58)		(-1.13)
Number of observations	26,910	26,910	25,304	25,304	52,214	52,214
Pseudo R-squared	.228	.231	.243	.243	.203	.204
Chi-squared	6569.9**	6668.0**	7666.6**	7672.2**	12,371**	12.437**

NOTE: Fixed effects for county of residence and Ambulatory Diagnostic Groups (except the preventive care group) were also included in the model.
** p-value ≤ 0.001   * p-value ≤ 0.01

Table F-9. Normalized Probit Coefficients (and z statistics) for the Probability of Compliance with the AAP Immunization Schedule Among Enrollees Aged 2-30 Months

	Children Aged 2-30 Months	
	County	Participant
Age	.106**	.104**
	(11.08)	(10.74)
Age squared	-.042**	-.043**
	(-9.76)	(-9.88)
Female (male omitted)	.000	.000
	(0.03)	(0.11)
Hispanic	-.009	-.009
	(-1.75)	(-1.82)
Native American	-.058**	-.058**
	(-6.56)	(-6.56)
Other race/ethnicity	-.083**	-.084**
(white omitted)	(-12.08)	(-12.16)
Months enrolled in Medicaid	-.004**	-.005**
	(-6.17)	(-6.8 1)
SSI-related category	-.033	-.033
	(- 1.30)	(-1.30)
Other eligibility category 1990	.026**	.023*
	(3.3 1)	(3.01)
Other eligibility category 1993	.047**	.049**
(AFDC-related omitted)	(8.37)	(8.62)
Number of children per child health provider	.002	.002
	(0.34)	(0.41)
1993 (1990 omitted)	.075**	.074**
	(7.84)	(7.78)
PCN county x 1993	-.031*	—
	(-3.16)	
Late PCN enrollee	—	-.030*
		(-2.93)
Full-period PCN enrollee	—	.006
		(0.49)
PCN disenrollee	—	-.013
		(-1.05)
Never enrolled in PCN	—	-.045**
(1990 all counties and 1993		(-4.57)
control counties omitted)		
Number of observations	26,910	26,910
Pseudo R-squared	.164	.165
Chi-squared	4082.0**	4113.6**

NOTE: Fixed effects for county of residence and Ambulatory Diagnostic Groups (except the preventive care group) were also included in the model.

** p-value ≤ 0.001   • p-value ≤ 0.01

Table F-10. Normalized Probit Coefficients for the Probability of Pap Smear During the Year Among Female Enrollees Aged 19-39 Years

	AFDC & Other Adults		SSI Adults	
	County	Participant	County	Participant
Age	.000	.000	.022	.022
	(0.11)	(0.06)	(2.47)	(2.45)
Age squared	-.000	-.000	-.000	-.000
	(-0.68)	(-0.64)	(-2.3 1)	(-2.29)
Hispanic	-.002	-.002	-.043**	-.042*
	(-0.37)	(-0.42)	(-2.67)	(-2.58)
Native American	-.089**	-.089**	-.023	-.022
	(-12.26)	(- 12.26)	(- 1.92)	(- 1.87)
Other race/ethnicity	-.068**	-.069**	-.021	-.021
(white omitted)	(-8.58)	(-8.63)	(- 1.79)	(-1.78)
Months enrolled in Medicaid	.008**	.007**	.013**	.013**
	(12.70)	(10.78)	(4.32)	(4.06)
Other eligibility category 1990	.010	.005	—	—
	(0.71)	(0.36)		
Other eligibility category 1993	.076**	.080**	—	—
(AFDC-related omitted)	(5.95)	(6.23)		
Rural county (urban omitted)	-.056**	-.056**	-.038**	-.038**
	(-11.64)	(-11.61)	(-3.51)	(-3.48)
Per capita income in county	.000	.ooo	-.006	-.006
	(0.21)	(0.29)	(- 1.95)	(-1.97)
Number of primary care physicians per 100K population	-.016	-.019	-.060	-.062
	(-1.21)	(- 1.39)	(-2.00)	(-2.05)
Emergency rooms per square mile	-.058**	-.057**	-.003	-.002
	(-8.46)	(-8.35)	(-.024)	(-.020)
Percentage of primary care physicians participating in PCN	.010	.010	-.011	-.011
	(1.35)	(1.27)	(-0.68)	(-0.66)
1993 (1990 omitted)	-.017	-.018	-.013	-.013
	(-2.32)	(-2.48)	(-0.83)	(-0.8 1)
PCN county x 1993	,018	—	.044	—
	(2.07)		(2.23)	
Late PCN enrollee	—	.023	—	.043
		(2.08)		(1.36)
Full-period PCN enrollee	—	.044**	—	.064*
		(4.35)		(2.61)
PCN disenrollee	—	-.001	—	.047
		(-0.13)		(1.46)
Never enrolled in PCN	—	-.017	—	.03 1
(1990 all counties and 1993 control counties omitted)		(-1.52)		(1.26)
Number of observations	23,822	23.822	3.015	3,015
Pseudo R-squared	.169	.171	.177	.178
Chi-squared	3582.5**	3624.8**	365.5**	367.6**

NOTE: Fixed effects for Ambulatory Diagnostic Groups (except preventive care) were also included in the regression.
** p-value ≤ 0.001   * p-value ≤ 0.01

Table F-11. Normalized Probit Coefficients (and z statistics) for the Probability of Any Outpatient Laboratory or Radiology Services Among Enrollees With Ambulatory Care

	Children		AFDC & Other Adults		SSI Adults	
	County	Participant	County	Participant	County	Participan
Infant	-.090**	-.090**	—	—	—	—
	(-11.09)	(-11.06)				
Age	.028**	.028**	-.006*	-.006*	.016**	.015*
	(16.46)	(16.32)	(-2.73)	(-2.71)	(9.53)	(9.17)
Age squared	-.001**	-.001**	.000	.000	-.000**	-.000*
	(-7.06)	(-7.01)	(2.52)	(2.50)	(-10.10)	(-9.68)
Age 65+ years	—	—	—	—	-.099**	-.085*'
					(-4.81)	(-4.09)
Female (male omitted)	-.023**	-.023**	.074**	.073**	.078**	.080*'
	(-6.46)	(-6.48)	(6.25)	(6.15)	(7.66)	(7.87)
Hispanic	-.007	-.007	.001	.001	-.120**	-.120**
	(-1.52)	(-1.55)	(0.14)	(0.11)	(7.36)	(-7.32)
Native American	-.099**	-.099**	-.176**	-.177**	-.000	-.003
	(-14.69)	(-14.67)	(-13.88)	(-13.92)	(-0.01)	(-0.22)
Other race/ethnicity [white omitted)	-.107**	-.107**	-.208**	-.209**	-.071**	-.073**
	(16.20)	(16.18)	(- 14.45)	(-14.49)	(-5.92)	(-6.06)
Months enrolled in Medicaid	.003**	.003**	.004**	.004**	.007**	.004
	(4.96)	(4.61)	(4.22)	(3.58)	(3.25)	(1.78)
SI-related eligibility category	.001	.000	—	—	—	—
	(0.05)	(0.04)				
Other eligibility category 1990	-.005	-.005	.092**	.090**	—	—
	(-0.66)	(-0.73)	(3.68)	(3.59)		
Other eligibility category 1993 (APDC-related omitted)	.011	.011	.105**	.106**	—	—
	(2.27)	(2.29)	(5.22)	(5.28)		
Number of primary care physicians per 100K population	.015	.010	-.167	-.165	-.318*	-.317*
	(0.31)	(0.21)	(-1.95)	(-1.93)	(-2.81)	(-2.80)
1993 (1990 omitted)	-.067**	-.068**	-.094**	-.094**	-.151**	-.146**
	(-8.82)	(-8.88)	(-7.41)	(-7.41)	(-8.25)	(-7.98)
CN county x 1993	-.020	—	-.007	—	.036	—
	(-2.38)		(-0.42)		(1.64)	
late PCN enrollee	—	-.014	—	-.024	—	.106**
		(- 1.43)		(-1.29)		(3.37)
all-period PCN enrollee	—	-.011	—	.005	—	.108**
		(-1.23)		(0.30)		(4.41)
CN disenrollee	—	-.036**	—	.006	—	.065
		(-3.66)		(0.34)		(2.08)
Never enrolled in PCN (1990 all counties and 1993 control counties omitted)	—	-.023	—	-.020	—	-.051
		(-2.23)		(-1.00)		(-2.11)
Number of observations	8 1,429	81,429	25,095	25,095	16,711	16,711
Pseudo R-squared	.222	.222	.333	.333	.347	.351
Chi-squared	23,221**	23,232**	10,999**	11,004**	8040**	8121**

NOTE: Fixed effects for county of residence and Ambulatory Diagnostic Groups were also included in the regression.
** p-value ≤ 0.001   • p-value ≤ 0.01

Table F-12. Ordinary Least Squares Regression Coefficients (and t statistics) for the Logarithm of the Number of Ambulatory Days of Care with Laboratory and Radiology Services Among Enrollees With Some Laboratory or Radiology Services

	Children		AFDC & Other Adults		SSI Adults	
	County	Participant	County	Participant	County	Participant
Infant	-.043*	-.046*	—	—	—	—
	(-2.82)	(-2.96)				
Age	.034**	.033**	-.006	-.006	.006	.006
	(11.76)	(11.36)	(-1.71)	(-1.81)	(1.63)	(1.71)
Age squared	-.001**	-.001**	.000	.000	-.000	-.000
	(-6.82)	(-6.52)	(2.41)	(2.48)	(-1.21)	(-1.29)
Age 65+ years	—	—	—	—	-.161**	-.163**
					(-3.98)	(-4.02)
Female (male omitted)	-.049**	-.049**	.055*	.055*	.081**	.080**
	(-7.95)	(-7.96)	(2.98)	(2.96)	(4.56)	(4.5')
Hispanic	-.024**	-.026**	.018	.017	-.048	-.047
	(-3.36)	(-3.55)	(1.60)	(1.55)	(-1.57)	(-1.52)
Native American	-.045**	-.046**	-.089**	-.088**	-.010	-.006
	(-3.36)	(-3.41)	(-4.45)	(-4.41)	(-0.47)	(-0.28)
Other race/ethnicity	-.081**	-.082**	-.093**	-.093**	-.009	-.008
(white omitted)	(-6.08)	(-6.14)	(-4.36)	(-4.34)	(-0.45)	(-0.42)
Months enrolled in Medicaid	.008**	.008**	.012**	.013**	.030**	.031**
	(7.47)	(7.10)	(8.23)	(7.94)	(7.54)	(7.66)
SSI-related eligibility category	.052**	.051**	—	—	—	—
	(3.38)	(3.32)				
Other eligibility category 1990	.025	.023	.059	.058	—	—
	(1.95)	(1.79)	(1.97)	(1.94)		
Other eligibility category 1993	.009	.011	.210**	.211**	—	—
(AFDC-related omitted)	(1.00)	(1.29)	(8.70)	(8.74)		
Number of primary care physicians	-.077	-.074	.249	.234	-.158	-.165
per 1OOK population	(-0.93)	(-0.90)	(2.15)	(2.02)	(-0.83)	(-0.87)
1993 (1990 omitted)	-.067**	-.068**	-.075**	-.076**	-.120**	-.122**
	(-5.14)	(-5.22)	(-4.09)	(-4.15)	(-3.69)	(-3.75)
PCN county x 1993	.005	—	-.005	—	.040	—
	(0.36)		(-0.24)		(1.08)	
Late PCN enrollee	—	-.020	—	-.008	—	-.045
		(-1.22)		(-0.32)		(-0.94)
Full-period PCN enrollee	—	.032	—	.022	—	.050
		(2.03)		(0.95)		(1.25)
PCN disenrollee	—	-.015	—	-.051	—	.017
		(-0.86)		(-2.00)		(0.35)
Never enrolled in PCN	—	.007	—	-.001	—	.089
(1990 all counties and 1993		(0.37)		(-0.02)		(1.99)
control counties omitted)						
Number of observations	27,916	27.916	15.810	15.810	8,165	8,165
Adjusted R-squared	.246	.246	,390	.390	.364	.364
F-test	123.9**	119.4**	141.4**	136.0**	66.71**	64.22**

NOTE: A constant and fixed effects for county of residence and Ambulatory Diagnostic Groups were also included in the regression.

** p-value ≤ 0.001   • p-value ≤ 0.01

Table F-13. Normalized Probit Coefficients (and z statistics) for the Probability of Any Outpatient Medications

	Children		AFDC & Other Adults		SSI Adults	
	County	Participant	County	Participant	County	Participant
infant	-.024*	-.017	—	—	—	—
	(-3.17)	(-2.18)				
Age	-.071**	-.072**	.004	.004	.001	.001
	(-48.64)	(-49.16)	(1.92)	(2.06)	(1.29)	(1.16)
Age squared	.003**	.003**	-.000	-.000	.000*	.000*
	(36.54)	(37.04)	(-2.00)	(-2.08)	(2.82)	(3.02)
Age 65+ years	—	—	—	—	-.092**	-.080**
					(-8.78)	(-7.49)
Female (male omitted)	-0.20**	-0.21**	.167**	.165**	-.124**	-.123**
	(-6.32)	(-6.34)	(19.54)	(19.31)	(-71.16)	i-20.91)
Hispanic	-.008	-.009	-.023*	-.023*	-.125**	-.124**
	(-1.96)	(-2.10)	(-3.06)	(-3.10)	(-12.57)	(-12.48)
Native American	-.198**	-.197**	-.229**	-.230**	-.059**	-.064**
	(-34.35)	(-34.26)	t-22.37)	(-22.48)	(-5.91)	(-6.31)
Other race/ethnicity	-.233**	-.234**	-.289**	-.290**	-.150**	-.151**
(white omitted)	(-40.35)	(-40.59)	(-25.80)	(-25.87)	(-20.81)	(-20.94)
Months enrolled in Medicaid	.046**	.044**	.045**	.042**	.043**	.042**
	(99.45)	(90.81)	(57.06)	(50.82)	(42.59)	(40.83)
SSI-related eligibility category	.137**	.143**	—	—	—	—
	(15.35)	(16.06)				
Other eligibility category 1990	-.005	-.013	.292**	.285**	—	—
	(-0.80)	(-1.97)	(13.60)	(13.25)		
Other eligibility category 1993	-.002	.002	.261**	.264**	—	—
AFDC-related omitted)	(-0.43)	(0.41)	(15.13)	(15.38)		
Number of primary care physicians er 100K population	.002	-.005	-.096	-.116	.102	.104
	(0.04)	(-0.12)	(-1.26)	(-1.51)	(1.50)	(1.53)
1993 (1990 omitted)	.083**	.080**	.050**	.049**	.051**	.052**
	(12.72)	(12.32)	(4.61)	(4.45)	(5.00)	(5.09)
CN county x 1993	-.037**	—	-.058**	—	-.036*	—
	(4.93)		(-4.31)		(-2.81)	
late PCN enrollee		-.018	—	-.030	—	.042
		(-2.00)		(-1.77)		(1.81)
full-period PCN enrollee		-.005	—	-.010	—	.040
		(-0.60)		(-0.66)		(2.43)
CN disenrollee		-.019	—	-.032	—	.027
		(-2.06)		(-1.80)		(1.14)
ever enrolled in PCN		-1.00**	—	-.145**	—	-.073**
1990 all counties and 1993 control counties omitted)		(-11.36)		(-9.12)		(-5.38)
Number of observations	116,366	116,366	35,741	35,747	35,211	35,211
Pseudo R-squared	.206	.207	.250	.252	.211	.213
Chi-squared	33,245**	33,422**	12,289**	12,3979**	9,827**	9,921**

NOTE: Fixed effects for county of residence were also included in the regression.
** p-value ≤ 0.001   * p-value ≤ 0.01

Table F-14. Ordinary Least Squares Regression Coefficients (and t statistics) for the Logarithm of the Number of Medications Among Enrollees With Medications

	Children		AFDC & Other Adults		SSI Adults	
	County	Participant	County	Participant	County	Participant
Infant	-.263**	-.266**	—	—	—	—
	(-19.46)	(-19.60)				
Age	-.070**	-.071**	.008	.007	.025**	.025**
	(-25.02)	(-25.28)	(1.93)	(1.83)	(10.82)	(11.01)
Age squared	.004**	.004**	.000	.000	-.000**	-.000**
	(23.14)	(23.36)	(1.24)	(1.33)	(-7.24)	(-7.56)
Age 65+ years	—	—	—	—	.015	-.010
					(0.51)	(-0.32)
Female (male omitted)	.011	.011	.060*	.056**	.266**	.262**
	(1.84)	(1.85)	(2.99)	(2.78)	(16.05)	(15.90)
Hispanic	-.035**	-.036**	-.090**	-.091**	-.207**	-.208**
	(-5.01)	(-5.16)	(-6.61)	(-6.70)	(-7.36)	(-7.43)
Native American	-.071**	-.071**	-.299**	-.301**	-.240**	-.220**
	(-5.58)	(-5.58)	(-12.82)	(-12.90)	(-9.67)	(-8.90)
Other race/ethnicity	-.117**	-.118**	-.211**	-.214**	-.218**	-.213**
(white omitted)	(-9.49)	(-9.54)	(-8.18)	(-8.29)	(-11.84)	(-11.61)
Months enrolled in Medicaid	.033**	.033**	.045**	.043**	.100**	.102**
	(33.59)	(32.19)	(25.62)	(23.15)	(27.57)	(28.20)
SSI-related eligibility category	.391**	.390**	—	—	—	—
	(23.38)	(23.27)				
Other eligibility category 1990	-.047**	-.048**	.194**	.183**	—	—
	(-4.09)	(-4.21)	(4.90)	(4.60)		
Other eligibility category 1993	-.015	-.013	.182**	.192**	—	—
(AFDC-related omitted)	(-1.94)	(-1.59)	(5.54)	(5.84)		
Number of primary care physicians	-.189	-.187	-.216	-.243	-.145	-.163
per 100K population	(-2.47)	(-2.45)	(-1.57)	(-1.76)	(-0.86)	(-0.96)
1993 (1990 omitted)	.024	.023	-.107**	-.110**	.092*	.080*
	(1.94)	(1.84)	(-4.82)	("4.99)	(2.98)	(2.60)
PCN county x 1993	-.012	—	-.021	—	.015	—
	(-0.86)		(-0.84)		(0.42)	
Late PCN enrollee	—	-.044*	—	-.044	—	-.334**
		(-2.78)		(-1.45)		(-5.85)
Full-period PCN enrollee	—	.018	—	.043	—	-.142**
		(1.22)		(1.54)		(-3.37)
PCN disenrollee	—	-.028	—	-.041	—	-.214**
		(-1.70)		(-1.33)		(-3.78)
Never enrolled in PCN	—	.006	—	-.104**	—	.140**
(1990 all counties and 1993		(-0.38)		(-3.17)		(3.79)
control counties omitted)						
Number of observations	58,352	58,352	19,666	19,666	22,071	22,071
Adjusted R-squared	.410	.410	,456	,457	.196	.201
-test	548.2'9	527.5**	230.3**	221.9**	76.63**	76.09**

NOTE: A constant and fixed effects for county of residence and Ambulatory Diagnostic Groups were also included in the **regression.**
** p-value ≤ 0.001   * p-value ≤ 0.01

Table F-15. Normalized Probit Coefficients (and z statistics) for the Probability of Any Non-Delivery Hospital Stays

	Children[1]		AFDC & Other Adults		SSI Adults	
	county	Participant	County	Participant	county	Participant
Age	-.014**	-.014**	.003**	.003**	.001	.001
	(-34.95)	(-34.54)	(4.48)	(4.51)	(2.43)	(1.90)
Age squared	.001**	.001**	-.000**	-.000*	-.000	-.000
	(31.79)	(31.47)	(-3.13)	(-3.15)	(-1.28)	(-0.65)
Age 65+ years	—	—	—	—	-.091	-.082
					(-15.63)	(-14.06)
Female (male omitted)	.006**	.006**	.016**	.016**	.016**	.015**
	(5.71)	(5.73)	(-4.55)	(-4.54)	(5.19)	(4.86)
Hispanic	-.003	-.003	-.016**	-.016**	-.004	-.003
	(-2.34)	(-2.28)	(-5.57)	(-5.55)	(-0.74)	(-0.67)
Native American	-.002	-.002	-.011*	-.012*	.001	-.002
	(-1.33)	(-1.36)	(-3.06)	(-3.08)	(0.26)	(-0.34)
Other race/ethnicity	.004	.004	-.014**	-.014**	-.014**	-.014**
(white omitted)	(2.27)	(2.30)	(-3.67)	(-3.69)	(-3.53)	(-3.72)
Months enrolled in Medicaid	.003**	.003**	.006**	.006**	-.001	-.002
	(18.44)	(18.47)	(18.31)	(17.04)	(-1.06)	(-3.04)
SH-related eligibility category	.119**	.117**	—	—	—	—
	(31.56)	(31.14)				
Other eligibility category 1990	-.002	-.001	.013	.012	—	—
	(-0.82)	(-0.65)	(1.16)	(1.12)		
Other eligibility category 1993	-.003	-.003	.019	.019	—	—
(AFDC-related omitted)	(-1.89)	(-2.00)	(2.21)	(2.17)		
Number of primary care physicians	.029	.030	-.005	-.004	.034	.040
per 100K population	(2.20)	(2.31)	(-0.17)	(-0.15)	(0.94)	(1.10)
1993 (1990 omitted)	.008**	.008**	-.003	-.003	.013	.014
	(4.28)	(4.38)	(-0.79)	(-0.77)	(2.34)	(2.51)
PCN county × 1993	-.007*	—	-.002	—	.012	—
	(-3.10)		(-0.49)		(1.76)	
Late PCN enrollee	—	-.008*	—	.001	—	.056**
		(-3.15)		(0.13)		(4.38)
Full-period PCN enrollee	—	-.010**	—	-.004	—	.046**
		(-4.44)		(-0.78)		(4.93)
PCN disenrollee	—	-.004	—	.001	—	.090**
		(-1.45)		(0.24)		(6.52)
Never enrolled in PCN	—	-.002	—	-.007	—	-.016
(1990 all counties and 1993		(-0.56)		(-1.13)		(-2.26)
control counties omitted)						
Number of observations	107,558	107,558	35.731	35,731	35,211	35.211
Pseudo R-squared	.083	.084	.043	.043	.038	.044
Chi-squared	2858.6**	2879.1**	645.7**	648.8**	846.9**	993.3**

[1] Infants were excluded from these regressions.
NOTE: Fixed effects for county of residence were also included in the regression
** p-value ≤ 0.001   * p-value ≤ 0.01

Table F-16. Ordinary Least Squares Regression Coefficients (and t statistics) for the Logarithm of the Number of Inpatient Days for Non-Delivery-Related Conditions Among Enrollees With Non-Delivery Hospital Stays

	Children[1]		AFDC & Other Adults		SSI Adults	
	County	Participant	County	Participant	County	Participant
Age	-.037	-.033	-.022	-.022	-0.50**	-0.42**
	(-2.54)	(-2.27)	(-1.73)	(1.68)	(-6.79)	(-5.74)
Age squared	.003**	.003**	.000	.000	.001**	.000**
	(3.90)	(3.66)	(1.74)	(1.69)	(7.59)	(6.55)
Age 65+ years	—	—	—	—	-.179	-.243*
					(-1.89)	(-2.59)
Female (male omitted)	-.054	-.053	-.061	-.060	.083	.081
	(- 1.67)	(-1.64)	(-1.03)	(- 1.02)	(1.74)	(1.70)
Hispanic	-.075	-.075	.034	.037	.022	.014
	(- 1.79)	(-1.81)	(0.71)	(0.78)	(0.30)	(0.20)
Native American	.043	.038	.004	.008	-.190*	-.155
	(0.75)	(0.67)	(0.07)	(0.12)	(-2.75)	(-2.27)
Other race/ethnicity	.023	.022	.136	.139	-.111	-.095
(white omitted)	(0.42)	(0.40)	(1.78)	(1.82)	(-1.97)	(- 1.70)
Months enrolled in Medicaid	-.021**	-.017**	-.019*	-.019*	-.020	-.009
	(-3.88)	(-3.02)	(-2.83)	(-2.75)	(-2.31)	(-1.08)
SSI-related eligibility category	.417**	.401**	—	—	—	—
	(7.52)	(7.18)				
Other eligibility category 1990	.103	.112	-.095	-.093	—	—
	(1.56)	(1.70)	(-0.52)	(-0.50)		
Other eligibility category 1993	-.105	-.106	-.015	-.022	—	—
(AFDC-related omitted)	(-2.27)	(-2.30)	(-0.11)	(-0.15)		
Number of primary care physicians	-.181	-.147	-.942	-.930	-.070	-.139
per 100K population	(-0.42)	(-0.34)	(-2.07)	(-2.04)	(-0.14)	(-0.27)
1993 (1990 omitted)	-.132	-.128	-.393**	-.392**	.093	.071
	(- 1.96)	(-1.90)	(-5.49)	(-5.47)	(1.13)	(0.87)
PCN county x 1993	.251**	—	.198	—	.249	—
	(3.38)		(2.37)		(2.49)	
Late PCN enrollee	—	.168	—	.276*	—	-.040
		(1.93)		(2.75)		(-0.29)
Full-period PCN enrollee	—	.106	—	.150	—	-.103
		(1.23)		(1.59)		(-0.94)
PCN disenrollee	—	.363**	—	.207	—	.354*
		(4.12)		(2.03)		(2.61)
Never enrolled in PCN	—	.410**	—	.166	—	.648**
(1990 all counties and 1993		(4.45)		(1.40)		(5.83)
control counties omitted)						
Number of observations	4.045	4,045	1,960	1,960	3,404	3,404
Adjusted R-squared	.338	.341	.178	.177	.097	.117
F-test	29.26**	28.52**	6.95**	6.70**	6.17**	7.11**

[1] Infants were excluded from these regressions.

NOTE: A constant and fixed effects for county of residence and Ambulatory Diagnostic Groups were also included in the regression.

** p-value ≤ 0.001   * p-value ≤ 0.01

Table F-17. Normalized Probit Coefficients for the Probability of Delivery-related Hospital Stays and Ordinary Least Squares Regression Coefficients for the Number of Delivery-related Hospital Days for Women with Deliveries Among AFDC and Other Non-SSI Female Enrollees Aged 19-39 Years

	Probability of a Delivery-related Hospital Stay		Number of Delivery-related Hospital Days[1]	
	County	Participant	County	Participant
Age	-.033*	-.033*	-.034	-.034
	(2.81)	(2.82)	(-1.31)	(-1.31)
Age squared	.000	.000	.001	.001
	(0.78)	(0.78)	(1.65)	(1.64)
Hispanic	.053**	.053**	.038	.038
	(3.49)	(3.50)	(1.21)	(1.20)
Native American	.089**	.089**	.056	.057
	(4.64)	(4.66)	(1.21)	(1.21)
Other race/ethnicity	.081**	.081**	.026	.027
(white omitted)	(3.74)	(3.75)	(0.53)	(0.54)
Months enrolled in Medicaid	.001	.000	-.018**	-.017**
	(0.40)	(0.19)	(-4.08)	(-3.70)
Other eligibility category 1990	.199**	.199**	-.003	.002
	(8.67)	(8.61)	(-0.06)	(0.03)
Other eligibility category 1993	.231**	.231**	.011	.009
(AFDC-related omitted)	(10.94)	(10.93)	(0.28)	(0.22)
Rural county (urban omitted)	.055**	.055**	-.049	-.050
	(3.93)	(3.94)	(-1.62)	(-1.66)
Per capita income in county	-.007	-.007	.028**	.028**
	(-1.74)	(-1.76)	(3.28)	(3.29)
Number of primary care physicians per 100K population	.097	.095	.334**	.336*
	(2.37)	(2.34)	(3.91)	(3.93)
Emergency rooms per square mile	-.016	-.016	-.047	-.047
	(-0.90)	(-0.88)	(-1.14)	(-1.13)
Percentage of primary care physicians participating in PCN	-.072*	-.072*	-.014	-.014
	(-3.17)	(-3.17)	(-0.29)	(-0.29)
1993 (1990 omitted)	.015	.015	-.156**	-.154**
	(0.81)	(0.80)	(-3.79)	(-3.75)
PCN county x 1993	.014	—	-.059	—
	(0.59)		(-1.18)	
Late PCN enrollee	—	.021	—	-.062
		(0.73)		(-1.02)
Fll-period PCN enrollee	—	.022	—	-.050
		(0.86)		(-0.86)
PCN disenrollee	—	.003	—	-.102
		(0.09)		(-1.60)
Never enrolled in PCN	—	-.009	—	-.014
(1990 all counties and 1993 control counties omitted)		(-0.25)		(-0.21)
Number of observations	4,289	4,289	3,206	3.206
Pseudo R-squared	.216	.216	.105	.105
Chi-squared	1045.9**	1047.2*	9.35**	8.79**

constant and fixed effects for Ambulatory Diagnostic Groups (except the pregnancy group) were also included   this regression.

** p-value ≤ 0.001   * p-value ≤ 0.01

Table F-18. Normalized Probit Coefficients (and z statistics, for the Probability of Any Medicaid Payments

	Children		AF'DC & Other Adults		SSI Adults	
	County	Participant	County	Participant	County	Participan
Infant	.110**	.114**	—	—	—	—
	(18.48)	(19.24)				
Age	-.056**	-.056**	.001	.001	.000	.000
	(-46.32)	(-46.74)	(0.68)	(0.83)	(0.63)	(0.53)
Age squared	.002**	.003**	-.000	-.000	.000*	.000*
	(35.39)	(35.80)	(-1.7-t)	(-1.84)	(2.67)	(2.85)
Age 65+ years	—	—	—	—	-.183**	-.176**
					t-20.89)	t-19.96)
Female (male omitted)	-.016**	-.016**	.164**	.163**	.102**	.101**
	(-6.05)	f-6.08)	(24.47)	(24.34)	(20.44)	(20.35)
Hispanic	-.005	-.005	-.033**	-.033**	-.014	-.014
	(-1.33)	(-1.45)	(-5.26)	i-5.3-t)	t-1.73)	(-1.67)
Native American	-.045**	-.045**	-.057**	-.058**	- 031**	-.0.:-t--
	(-9.36)	(-9.31)	(-6.94)	(-7.08)	t-3.53)	(-3.88)
Other race/ethnicity	-.081**	-.082**	-.105**	-.107**	-.068**	-.068**
(white omitted)	(- 15.66)	(- 15.99)	(-11.15)	(-11.30)	(-1 1.09)	(-11.17)
Months enrolled in Medicaid	.043**	.042**	.040**	.038**	.032**	.031**
	(1 19.90)	(1 10.99)	(66.99)	(61.18)	(40.14)	(38.76)
SI-related eligibility category	.095**	.099**	—	—	—	—
	(13.02)	(13.66)				
Other eligibility category 1990	.005	-.000	.212**	.211**	—	—
	(0.89)	(-0.06)	(15.18)	(15.01)		
Other eligibility category 1993	-.010	-.007	.208**	.208**	—	—
(AFDC-related omitted)	(-2.55)	(-1.85)	(17.75)	(17.90)		
Number of primary care physicians	.180**	.178**	.096	.087	.151*	.154*
per 100K population	(5.03)	(4.97)	(1.59)	(1.45)	(2.66)	(2.72)
993 (1990 omitted)	.099**	.098**	.078**	.077**	.084**	.085**
	(18.15)	(17.90)	(8.97)	(8.90)	(9.82)	(9.89)
CN county x 1993	-.032**	—	-.052**	—	-.048**	—
	(-5.00)		(-4.84)		(- 4 . 3 8	
ate PCN enrollee	—	-.008	—	-.016	—	.022
		(-1.07)		(-1.17)		(1.01)
lll-period PCN enrollee	—	-.008	—	-.025	—	-.003
		(-1.15)		(-1.93)		(-0.19)
CN disenrollee	—	-.013	—	-.024	—	.019
		(-1.57)		(-1.60)		(0.87)
ever enrolled in PCN	—	-.087**	—	-.119**	—	-.071**
1990 all counties and 1993		(-1 1.16)		(-8.79)		(-6. 10)
control counties omitted)						
umber of observations	1 16,366	116,366	35.747	35,747	35.21 1	35.211
seudo R-squared	.172	.173	.193	.195	.132	.133
hi-squared	23,489	23,656	7843.3**	7928.0**	5227.6**	5281.8**

NOTE: Fixed effects for county of residence were also included in the regression.
** p-value ≤ 0.001   * p-value ≤ 0.01

Table F-19. Ordinary Least Squares Regression Coefficients (and t statistics) for the Logarithm of Total Medicaid Payments Among Enrollees With Payments

	Children		AFDC & Other Adults		SSI Adults	
	County	Participant	County	Participant	County	Participant
Infant	.719**	.714**	—	—	—	—
	(49.29)	(48.80)				
Age	-.082**	-.081**	-.011*	.011*	-.027**	-.026**
	(27.32)	(-27.06)	(-2.61)	(-2.60)	(-9.59)	(-9.36)
Age squared	.005**	.005**	.000**	.000**	.000**	.000**
	(27.56)	(27.35)	(4.03)	(4.02)	(12.97)	(12.62)
Age 65+ years	—	—	—	—	-.230**	-.275*
					(-6.18)	(-7.41)
Female (male omitted)	.012	.013	-.021	-.019	.098**	.094**
	(1.99)	(2.00)	(-0.98)	(-0.89)	(4.79)	(4.61)
Hispanic	-.057**	-.057**	-.061**	-.060**	-.072	-.076
	(7.16)	(7.14)	(-3.84)	(-3.81)	(-2.18)	(-2.29)
Native American	.155**	.155**	-.007	-.007	-.280**	-.254*
	(13.25)	(13.23)	(-0.33)	(-0.30)	(-8.78)	(-7.98)
Other race/ethnicity (white omitted)	.111**	.112**	-.024	-.024	-.154**	-.146*
	(9.43)	(9.50)	(-0.98)	(-0.95)	(-6.55)	(-6.24)
Months enrolled in Medicaid	.026**	.027**	.031**	.031**	.033**	,039'
	(25.10)	(25.24)	(16.44)	(15.89)	(7.86)	(9.15)
SSI-related eligibility category	.529**	.525**	—	—	—	—
	(29.89)	(29.63)				
Other eligibility category 1990	-.032*	-.027	.650**	.652**	—	—
	(-2.56)	(-2.19)	(14.28)	(14.30)		
Other eligibility category 1993 (AFDC-related omitted)	-.004	-.005	.545**	.543**	—	—
	(-0.48)	(-0.62)	(14.98)	(14.90)		
Number of primary care physicians per 100K population	.078	.085	-.005	-.008	-.327	-.333
	(0.94)	(1.02)	(-0.03)	(-0.05)	(-1.50)	(-1.53)
1993 (1990 omitted)	-.084**	-.083**	-.219**	-2.19**	.016	-.004
	(-6.43)	(-6.34)	(-9.20)	(-9.19)	(0.43)	(-0.11)
PCN county x 1993	.199**	—	.170**	—	.147**	—
	(13.58)		(5.98)		(3.35)	
Late PCN enrollee	—	.175**	—	.208**	—	-.279**
		(10.17)		(6.08)		(3.88)
Full-period PCN enrollee	—	.189**	—	.150**	—	-.226**
		(11.48)		(4.75)		(-4.27)
PCN disenrollee	—	.198**	—	.155**	—	-.093
		(11.08)		(4.43)		(-1.29)
Never enrolled in PCN (1990 all counties and 1993 control counties omitted)	—	.244**	—	.178**	—	.366**
		(13.39)		(4.86)		(8.00)
Number of observations	84.313	84.313	26,565	26,565	26,385	26,385
Adjusted R-squared	.594	.594	.617	.617	.391	.396
F-test	1667.5**	1603.1**	594.5**	570.8**	239.1**	235.2**

NOTE: A constant and fixed effects for county of residence and Ambulatory Diagnostic Groups were also included in the regression.
** p-value ≤ 0.001   * p-value ≤ 0.01